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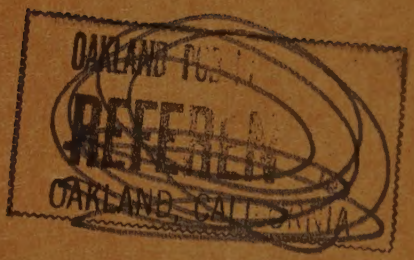
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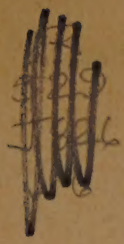

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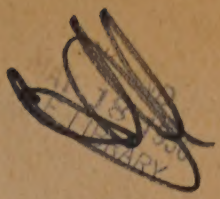

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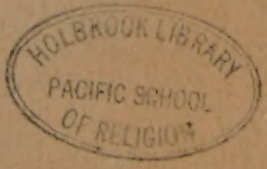

THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

FEBRUARY						
S	M	T	W	T	F	S
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..

MARCH						
S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Second Quarter

APRIL						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

MAY						
S	M	T	W	T	F	S
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19	20	21	22	23	24	25
26	27	28	29	30	..	..

JUNE						
S	M	T	W	T	F	S
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
						**

Third Quarter

JULY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

AUGUST						
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19	20	21	22	23	24	25
26	27	28	29	30	..	..

SEPTEMBER						
S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Fourth Quarter

OCTOBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

NOVEMBER						
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26	27	28	29	30	..	..

DECEMBER						
S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
						*

*YEAR-END DAY, December Y, follows December 30th every year
**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance."—Robert Bridges.

LORD DESBOROUGH

His notable address on calendar reform in the House of Lords on March 4, 1936, and also the speeches made by the Archbishop of Canterbury, Lord Feversham and Lord Merthyr, are printed in this issue.

(See Articles on Pages 4 to 24)

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PROGRESS AT THE LEAGUE

By DR. ALFREDO DE CASTRO

Minister Plenipotentiary of Uruguay to Switzerland, Belgium and the Netherlands; Vice-Chairman of the League of Nations' "Advisory and Technical Committee on Communcations and Transit"

WITH increasing truth Geneva might be called the nerve centre of mankind. Human impulses from every corner of the globe move toward it—are received, codified, refined and presented back to the world as an effort toward the improvement of life. Imperfect as some of the recommendations may be, unworkable as others may develop, the desire and tendency is still toward stabilization; and everywhere men of good will must consider that League policies are constructive policies.

It is under this heading that the world important subject of calendar reform receives serious and impartial treatment. Fifteen years ago sufficient progress had been made by the advocates of a simpler calendar to draw to it the attention of Geneva. The 1923 and 1931 discussions that followed were so full that hundreds of suggested calendars were considered. The League narrowed the inquiry down to two only and now the time has come to take still another step forward.

Both plans approved as possible of acceptance are too well known to need more than mention by name—The Fixed Calendar of 13 Months and The World Calendar where balance is obtained through equal quarters. Both are perpetual, each year exactly comparable with all future years.

The plans have been before the world for more than a generation and,

during the past five years, have had intense propagation. To Geneva has come the result—waves of public reaction that are measurable. Like water finding its own level, the two plans have developed in overlapping and significant spheres of usefulness. The twelve-month World Calendar has appealed to wide, almost universal, public opinion; the 13-month scheme has become highly specialized.

This specialization has concerned itself with the exact accounting systems of certain modern businesses. By all pure mathematical logic, it is the better plan of the two—but alas! we are not creatures of logic. The 13-month calendar makes a beautiful picture. Each month has four weeks of seven days—a complete little unit in perpetuity that lends itself remarkably to commerce.

In its rigidity, in its very name "fixed," it errs against human behavior. For all ordinary purposes its number "13" is the most awkward of figures. Laugh as we may at superstition—it cannot be discounted as one of the world's greatest forces. Except for business the 13-month calendar has not been accepted. And, gradually, its sponsors have realized its changed status and are now sensibly developing it in that field.

The appeal of The World Calendar may begin with the fact that the months are retained, the seasons stabilized and the whole structure of the year balanced within the framework of a simple and easy system designed in the interests of all classes of a vast world public.

The details are not unalterably fixed. The master plan calls for a calendar of twelve months with equal quarters and an even half year. Actual adjustments to achieve perpetuity are suggested but will be arranged by consultation and agreement. This reasonable attitude by advocates who serve no special interest has done much to win consideration by the world at large.

I will do no more than recount some of the reaction that has reached Geneva. The appointment of a date for the celebration of Easter—one that will not change from year to year—is an integral part of any proposal for calendar reform; on that, many bodies base their support. As far back as 1928, the Parliament of Great Britain passed its Easter Act stabilizing this sacred period; the beginning of legislative action for a balanced calendar. The forty-four nations in conference in Geneva in 1931 followed Britain's lead in a "no declaration" policy regarding the merits of adoption of calendar reform generally, but the four greatest countries of Europe opposed the 13-month scheme.

Since then the British Parliamentary Committee on Calendar Reform, London Chamber of Commerce, the Powerful Trades Union Congress and the Church of England have firmly favored revision. The German government, through its Ministry of the Interior, has declared (1935) for reform, providing the familiar twelve months are retained.

In North America, calendar reform has wide general approval—particularly The World Calendar plan. South America and its sister states in Central America have been even more active from an official point of view. The numbers of official committees and the distinguished names they include make an impressive array. Represented are the Argentine Republic, Bolivia, Brazil, Chile, Colombia, Costa Rica, Mexico, Panama, Peru, and Uruguay. In the latter nation as recently as January of 1936, President Terra has offered his cooperation.

The churches of the world, because of their feast and special observance days, are intimately concerned with the problem of simplification. Representing the Protestant Churches, the Universal Christian Council for Life and Work meeting in Denmark in 1934 passed a resolution supporting calendar reform and urging action by the various governments. This body is strongly represented at Geneva.

If the almost solidly Roman Catholic nations of Latin America can be used to indicate an example, it can be confidently expected that full support, in due time, will be forthcoming from the Vatican.

The question will again be examined at the League—sympathetically and impartially. Recommendations will follow the wishes of the delegates in conference. After that remains agreement—for it can be taken as certain that nothing can stop the impetus of this movement. Agreement will be directly the business of the nations endorsing reform—and a difficult business, but the urge to simplify and balance man's arbitrary division of time will probably solve the problem in the modern way. That is, speedily.

OBITUARY NOTES

DR. JAMES HENRY BREASTED, director of the Oriental Institute of the University of Chicago and for many years one of the greatest authorities on the history of the calendar, died in New York on December 2. His most recent contribution to calendar research was a lecture on "The Beginnings of Time-Measurement and the Origins of our Calendar," delivered on the James Arthur Foundation at New York University on May 16, 1935. The text of his lecture will be published in a forthcoming issue of the Journal of Calendar Reform.

JOHN J. GLESSNER, one of the founders of the International Harvester Company, died on January 20 at the age of 93 years. He had been a member of The World Calendar Association since 1933.

DR. CHARLES CARROLL, Supervisor of Public Education in Rhode Island, died in his 60th year on February 4. Early in 1933 he became a member of The World Calendar Association.

CHRISTIAN B. ZABRISKIE, former president of the Pacific Coast Borax Company, died on February 8. As a member of the New York State Chamber of Commerce, he became interested in the Chamber's leadership in calendar reform, and joined The World Calendar Association in 1935.

GEORGE SEYMOUR GODARD, Connecticut State librarian for 35 years, died on February 12. Past president of the National Association of State Librarians and president of the American Association of Law Librarians, he was 71 years of age. He was one of the early members of The World Calendar Association.

HOUSE OF LORDS DEBATE

In the British House of Lords, on March 4, 1936, the subject of calendar reform was brought up on a motion by Lord Merthyr, whose opening speech urged the government "by their interest and action" at the League of Nations, to render this reform possible in 1939. Notable speeches followed from Lord Desborough and the Archbishop of Canterbury, both supporting revision of the calendar. Finally the government spokesman, Lord Feversham, replied for the government, promising definitely that "if the matter is placed on the Agenda of the approaching meeting of the League Commission on Communications and Transit, the whole question will have the most sympathetic and serious consideration of the representatives of His Majesty's Government." The following textual account is slightly abridged from the official report.

(Footnotes by P. W. Wilson, former member of Parliament from St. Pancras, London)

LORD MERTHYR rose to ask His Majesty's Government whether it is proposed to take any steps to accelerate, at the forthcoming meeting of the Transit Section of the League of Nations, the adoption by international action of a fixed calendar; and to move for Papers.[1] The noble Lord said:

"My Lords, in asking the question which stands in my name this afternoon, I do not propose to weary the House with all the possible arguments in favor of a reform of the calendar. In the first place it would take a long time, and in the second place I doubt whether they would be, all of them, strictly relevant to the particular Question that I have put down.

"But I want, if I may, to put forward a sufficient number of those arguments to justify my plea that His Majesty's Government should take action at Geneva in the near future. One obvious reason for international action is that it is not desirable that one country should have a different calendar from its neighbors, although that was the case for great periods in the past, and the immediate cause for this demand for Government action is that there is taking place this year at Geneva a meeting of the section of the League of Nations devoted to communications and transit.

"One of their quinquennial meetings takes place next October. I wish to urge His Majesty's Government, first of all, to see that this matter of calendar reform is placed upon the agenda; and secondly, to instruct a representative to attend this meeting and to put forward the views of this country upon that question.

"There is some little urgency about this matter in the minds of those who want reform, because the calendar can only be reformed in the way

[1] Baron Merthyr of Senghenydd in Glamorganshire—William Brereton Couchman Lewis—was educated at Eton and Magdalen College, Oxford. He is Honorary Treasurer of the University College of Wales and the Archbishop of Wales is his uncle by marriage. . . . According to Parliamentary procedure in Great Britain, "moving for papers" is a formal manner of initiating a discussion. Such a motion means that the subject is in order for discussion but the motion expresses no view of the subject, either favorable or otherwise.

they desire in a year when the first day of January falls upon a Sunday. The next year when that happens is 1939, and if we miss the opportunity in 1939 there will not be another until 1950.

"Perhaps I may remind your Lordships for one moment of the history of the matter of the calendar. It starts with the Julian Calendar, which was altered by the Emperor Augustus, who was sufficiently vain to wish a day to be taken out of February and placed in August merely because his birthday happened to fall in that month.[2] I would ask your Lordships to think of the sum total of inconvenience which the people of the world have suffered because of that fact 2,000 years ago.

"Then, in the year 1582, the Gregorian Calendar was instituted. But it was not until 170 years later that England summoned enough courage to alter her own calendar to conform with it. In 1835 the proposal was first made for a calendar of 13 months—a proposal which has received much attention during the past hundred years, which has caused a great many conferences to be held and a great many societies to be formed, and which is one of the subjects demanding attention today. There have even been Bills presented in Parliament towards this end.

"What is wanted now is a lead from His Majesty's Government—a lead at Geneva, and a lead, if I may respectfully say so, a little different from that which was given in the year 1931, when the Transit Section last met. At that meeting a representative of the British Government attended, and, without in any way wishing to criticize him as an individual, I would like to say that the attitude which he was no doubt instructed to take at that meeting did not inspire confidence in those who want this reform.[3] He, it seems to me, climbed very high upon the fence of doubt and indecision. I may perhaps quote some words of the official representative of His Majesty's Government, in 1931, from which it is not surprising, in my humble view, that this Conference reached no decision. He said:

> The vote which had just been taken would not be of any help to Governments in forming an opinion. He himself had not been able to do anything else but abstain because if he had said Yes, that would have implied that he agreed that there were advantages, and if he had said No, that would have implied that he agreed that there were no advantages. As far as he was concerned, neither of these indications would have been true.

"I submit that this was not a constructive or hopeful statement, and I ask that in 1936 something more definite may go from here to Geneva. Because there is evidence to show that the rest of the world desires and expects a lead from this country. Those members of the organizations concerned who travel in the world experience this sort of statement: 'If only your Government would do something about this we could get on

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[2] This is the traditionally accepted view of the matter. Later research has thrown doubt on the responsibility of Augustus for the short February and the long August.

[3] The British representative was Lt.-Col. Sir John Baldwin, whose diplomatic career began in the consular service in 1902. He retired from the foreign office in 1932.

with it.' And again they say: 'But the British Government would be the slowest of all to accept this reform.'

"I hope that the reply which will be given this afternoon will not say that nothing will be done because there is no demand, that there is no weight of public opinion on the subject in Great Britain. It surely is not to be expected that the mass of the workers in this country, the unemployed men or the artisans have strong views about such a subject as calendar reform. It is as well that they have not, because they have other things to do and think about. But if it were really explained to the worker and to his wife that there would accrue to them very great advantages from this reform, his point of view and his answer to a query might be very different.[4] If, for example, it were explained to his wife that it would no longer be necessary, as it sometimes is now, to purchase a five weeks' supply of food with four weeks' pay, then she might have strong views about this subject. I hope also it will not be said by the noble Earl who will reply that nothing can be done because there are other more important things to be considered. I agree that there are, but the fact is that in those things it is very often the case that the solution of difficulties is not so easy and not so inexpensive as the solution of this one. Here is a problem which has a solution ready to be adopted, a solution which costs nothing.

PLANS FOR A NEW CALENDAR

"We suffer very much from apathy in this matter. Most of us tolerate the inconveniences of our present calendar because we do not know anything better. I dare say that the great majority of the people of this country are quite unaware that there is an alternative to the present calendar. It does not occur to them that whilst the length of our year and the length of our day are fixed for us and cannot be altered, the length of our month is a thing which we ourselves have fixed, and fixed just about as badly as we possibly could. For instance, if it was suggested to them that it would be inconvenient if our yard measure sometimes consisted of 34 inches, sometimes 36 inches and sometimes 37 inches, they would probably agree that such a situation ought not to be continued. It is now suggested that this unequal length of months is also a system which ought to be stopped and can be easily and inexpensively altered.

"There are a great many schemes for the reform of the calendar. There have been at various times anything from 180 to 300 such schemes, and the League of Nations has done most valuable work at its meetings in 1926 in reducing this large number of schemes down to two. Therefore there remain to be considered just two schemes of calendar reform.

"Both of these, in my submission, are infinitely better than the calendar

[4] A further argument that appeals to the worker is the addition of Year-End Day and Leap-Year Day as additional holidays—each as part of a week-end.

now in force; either would be a great improvement. Both contain this common principle, the principle of the blank day, which is a day that is not a day of the week nor a day of the month, but a day of the year, and by that means the calendar is fixed, and every day in the year is fixed for all time. Wednesday, March 4, would always be Wednesday, March 4. That principle has been accepted in both these schemes and, I think I may say, by the great majority of the nations who attended the League Conference at Geneva. There is some opposition to the idea. There is opposition from members of the Jewish faith and from the Seventh Day Adventists, but the weight of support which it has received renders it a scheme which ought to be thrashed out by the League of Nations.

"The advantages of fixing the calendar are in some cases apparent. Others are not at once so apparent to the casual observer, but I would ask your Lordships to consider for a moment how much easier our own daily plans would be if the calendar was fixed, if the clashing of dates by the wandering of the days of the months through the weeks was avoided. We should no more have difficulty such as the fixing of Easter on the day after the second Saturday in April, because the second Sunday in April would be, which it is not now, always the day following the second Saturday. There is reason to believe that, if the whole calendar was fixed, the one remaining obstacle to the fixing of Easter would be removed. I have reason for saying that the Roman Catholic Church would remove its objection to the fixing of Easter if the whole problem were settled and solved. The advantages to the mass of the people of this country would be very great. For example, if Christmas were always on a Monday it would be of immense advantage to shopkeepers and to hundreds of millions of people in business if they could have their Christmas holiday coinciding with the week-end.

"Many disadvantages would disappear. Business men would appreciate it if there were no longer any chance of fifty-three pay days occurring in the year instead of fifty-two or fifty-three Mondays upon which insurance stamps had to be affixed instead of fifty-two. There would be social advantages in the fixing of events. There would be even advantages in the fixing of the sittings of your Lordships' House. Finally the great stumbling block of the unequal month and the unequal quarter would be removed. I do not know whether it is generally realized that at present the second half of our year is two days longer than the first. I do not know whether it is generally realized that our quarters are of unequal length and the inconvenience which attaches to that fact. These disadvantages would be removed by the reform of the calendar.

"I mentioned that there were two systems now proposed. One has 13 months and the other has 12 months. Both are better than the present system, and I suggest that the solution of the difficulty as to which should

be adopted depends upon whether in general opinion the month or the quarter is the unit of time most valuable for accounting and costing purposes. If the month is more valuable, then we shall have the 13 months calendar: if the quarter is more valuable, then we shall have the 12 months calendar. Personally I say without hesitation that the 13 months calendar is the better of the two but, like many other people, I would be willing to support either of these two systems.

"What is it that His Majesty's Government are desired to do in this matter? It is desired that they will send a representative to Geneva armed with the opinion of organizations in this country as to whether the calendar should be reformed or not and, if so, as to which system this country desires; and, in order to arrive at some solution of the problem, the representative should be further instructed that if the majority of the nations of the world favor one scheme we shall be willing to adopt that scheme, the scheme of the majority. In other words, it is desired that the Government should take an active part in this Transit Section conference and really give a lead to the nations in bringing about this great reform.

"Just 20 years ago your Lordships were asked to approve of the principle of daylight saving. I wonder how true it is, as is so often said, that it needed the Great War to get through that reform which we now treat as commonplace and which the great majority of the people of this country now think is a very great advantage to the whole world. If it had not been for the War I wonder whether we should not still be putting forward objections and all sorts of arguments against Summer Time? How long will it be before we can get for the whole world the desirable reform of a fixed calendar?

"I claim for it with all modesty nothing less than this, that if the calendar was reformed it would be of some advantage, direct or indirect, to every man, woman and child in the civilized world, and I ask His Majesty's Government, by their interest and action in this matter, to render this reform possible in 1939, so that the manifest inconvenience which all of us now suffer shall be removed."

Lord Desborough was the next speaker.[5] He said:

LORD DESBOROUGH'S SPEECH

"My Lords, I hope that on this occasion I may be excused for saying a few words upon a matter to which I have devoted some considerable attention for many years past.

"Calendar reform is more and more occupying the attention of the world year by year, and many societies are ardently advocating it. I think

[5] Baron Desborough—William Henry Grenfell—is a Knight of the Garter and holds the Grand Cross of the Victorian Order. His mother was a Lascelles and so related to the Earl of Harewood who married the Princess Royal, only daughter of King George V. He was educated at Harrow and Balliol College, Oxford, rowed in the Oxford Boat against Cambridge, and has twice swum across Niagara. He is a sportsman of many parts and a cousin of Sir Wilfred Grenfell, social missionary to fishermen in Labrador.

we ought to be grateful to the League of Nations for the wonderful manner in which they have cleared the air in regard to the opinions of Christian nations on this matter. As my noble friend has just said, no fewer than 300 different schemes of calendar reform were placed before the League of Nations, now reduced to the more manageable number of two.

"My noble friend has said something about the two schemes. One is that the year should be divided into 13 months of an equal number of days, and the other, which I must say I personally look upon with greater favor, is that the present system of 12 months should be continued, but that the quarters and the half-years should be made equal. The first quarter would be ninety-one days, the second quarter ninety-one days, the third quarter ninety-one days, and the fourth quarter ninety-one days. The year would then be divided into equal quarters and equal half-years. The year would always begin on a Sunday and the dates would always be the same all through the year.

"The difficulty in dealing with calendar reform is this, that unfortunately the earth takes 365¼ days to go round the sun. If it could only complete its circuit in 364 days calendar reform would be a very simple thing, and we should have a stabilized calendar. My noble friend has stated what both these systems propose to do with regard to the extra day. It would come at the end of the year and it would probably be observed as a holiday. It would not be counted into the week or month but would just be a day.

"The 13 months year is nothing new. It was advocated more than 100 years ago by Auguste Comte, the French philosopher, but after that it rather dropped out of view. The objection to it is that it is associated with other objections that are naturally taken to the figure 13. Thirteen is not cleanly divisible into halves and quarters. There would be an extra month called Sol, which would not be received with any very great enthusiasm, either generally or by people who have birthdays about that time and who would find it rather inconvenient to have a birthday on a certain date in the month Sol. Moreover, I think that historical dates would also be rather upset if we suddenly introduced a new 13th month. Both schemes involve the elimination of the extra day and, as my noble friend said, if you adopt either scheme you have a perpetual calendar.

"There is not time on this occasion to go into a lengthy discussion on calendar reform, but there is one matter that is indissolubly bound up in it on which I have addressed your Lordships on more than one occasion. That is the question of a stabilized day for Easter, which now, it is conceded by high authorities, is wrapped up in the question of calendar reform. I do not know whether your Lordships remember that in 1928 I had the honor of proposing a Bill in this House which passed through both Houses of Parliament and is now an Act of Parliament. This Act

states that Easter Day shall in the calendar year next but one after the commencement of the Act, be the first Sunday after the second Saturday in April, and for the words 'is always the first Sunday after the full moon which happens upon or next after the full moon which happens upon or next after the 21st day of March, and if the full moon happens upon a Sunday, Easter Day is the Sunday after'—which is the way Easter Sunday is fixed now according to the tables of Clavius under Pope Gregory—there shall be substituted the words 'is always the first Sunday after the second Saturday in April.' That is a simpler designation and more convenient.

"I should like to say one word about the moon which is adopted in the Gregorian system. As Professor de Morgan points out, it is not the moon of the heavens but a fictitious imitation put wrong on purpose, partly to keep Easter out of the way of the Jews' Passover, and partly for the convenience of calculations. We have at the present time—and I think this is even more important as regards the dislocation of business—an Easter which can be moved 35 days. I see that in 1940 it will be almost as early as it can be—namely, the 24th of March, and in 1943 it will be on the very latest day, which is the 25th of April. This is a great oscillation, and has a very serious effect not only on industry, but on the civil life of the people. The law terms, the University terms and the terms of all the schools[6] in this country, and the great holidays of the people, Easter and Whitsuntide, now oscillate backwards and forwards in accordance with calculations which were made to Pope Gregory as long ago as 1582. This fact always impresses itself on my mind, namely, that if you fix the date of the birth of our Lord on December 25, it has this extraordinary effect that it tends to wander about under our present system with great inconvenience to the whole of the civilized world. This rule and the 35 days variation of Easter are now made contingent on the reform of the calendar.

VATICAN VIEWPOINT

"With the indulgence of the House I should like to explain that last year a very important delegation went to Rome on behalf of The World Calendar Association of the United States. It was instituted by the Rational Calendar Association of this country. This mission was supported by letters of delegation from the U. S. World Calendar Association, the Latin American Committees on Calendar Reform, the Bureau d'Etudes of Paris, and the Gesellschaft of Calendar Reform of Berlin.

"The important thing is that it was headed by a very celebrated Roman Catholic ecclesiastic, the Right Reverend Fernand Cabrol, Abbot of St. Michael's, Farnborough. He is one of the greatest authorities in the Roman Catholic Church, has written no fewer than 12 books on the subject and is one of the editors of the *Roman Catholic Encyclopedia.*

[6] In Great Britain, there are three legal and academic terms in the year—this, in contrast with two semesters in the United States.

"The important thing is that a Roman Catholic ecclesiastic of his eminence should come forward to support these two proposals—namely, the reform of the calendar and a fixed date for Easter. He submitted in Latin a Memorandum representing the views of all these various associations, which is now placed on record in the archives of the Vatican. As it comes from such a distinguished Roman Catholic authority perhaps your Lordships will forgive me if I read a few extracts from this Memorandum. The Memorandum begins:

On the reform of the calendar. Throughout all Christian nations today is spread a strong desire for a reform of the Gregorian Calendar. . . . Among the members of the societies advocating this reform are many serious students of religion who feel that the stabilization of Easter would remove from the Christian Ordo an anomaly which has no basis in true doctrine and was only incorporated in the practice of the Church for reasons which are no longer valid. . . . So great is the desire of the people of Great Britain for this reform that in 1928 the British Parliament passed an Act to introduce it. That this Act has never come into force is due solely to the fact that the Roman Catholic Church has not given its assent to the reform. . . .

The proposal to set aside one day out of the days of the week [this is in reference to the proposed calendar reform] is similarly intended for the general benefit of mankind and the promotion of Christian unity.[7] Its purpose is to enable the remaining 364 days of the year to be divided into 52 whole weeks, so that every year should begin on a Sunday and all the dates of the months fall always on the same days of the week. By this means a perpetual calendar would be established for all time.

This proposal is not necessarily of prime concern to the Church; it need only affect lay interests. But it would obviously be more acceptable to public opinion if it were accorded the sanction of the Church's authority. No Christian Community that has studied the question has found any objection to the proposal (with the exception of the Seventh-Day Adventists), and the Episcopal Church of America has expressed its official approval of it in the strongest terms.

Both these measures of reform can most easily be introduced in 1939 when the year will begin on a Sunday. Next year delegates to the League of Nations are to be called upon for a decision. There is great need today for the Church's guidance.

"Those are the principal paragraphs in this Memorandum, and I have also a *résumé* of the conclusions of the Mission of which I will quote only two: (1) The subject of calendar reform is under constant consideration at the Vatican, and close observation is being kept on the movement throughout the World; (2) the subject of calendar reform is viewed by the Vatican as a whole, and the question of Easter stabilization cannot be detached from the question of general reform.

"There is so much agreement now among the various Churches who replied to the *questionnaire* issued by the League of Nations that there is every hope of the Christian Churches combining with a request for the stabilization of Easter. Of course what we require is one Easter for Christendom. I was at one time rather disappointed that the Act to stabilize Easter was not put into force by Order in Council, but so much progress has been made now and so much agreement has been displayed

[7] The significant words here are "promotion of Christian unity." Christendom was divided for many centuries by differences over Easter and by the later difference between the Old Style (Julian) and the New Style (Gregorian). The World Calendar disposes of these controversial and irritating discrepancies.

among the various Churches that one has every hope of there being established one Easter for the whole of Christendom.

"Another matter to which I would like to refer is the attitude of the Greek Church. It has been said very often that the Greek Church is opposed to this reform, but really the father of this movement is Professor Eginitis, a strong Orthodox Churchman and a distinguished astronomer, who was Director of the National Observatory at Athens. He has been said to be the Sosigenes[8] of the present movement. I think that, when we are supported by such a high ecclesiastical authority as Dom Cabrol, and by Professor Eginitis on behalf of the Orthodox Church, we may consider that there is every prospect of agreement.

"This year is important because the Committee of the League of Nations, to which this matter was committed, only meets once in four years and there will be a meeting next October.[9] We hope that the delegates from the British Government will be commissioned not only to support the motion for a fixed date for Easter but also to explain the views of the British Government on the subject of calendar reform.

"As the Committee will not meet again for another four years it is obvious that there will be a great deal of delay unless something is done next October. If the delegates at Geneva then come to some agreement they would have to refer the matter to their respective Governments, and the Holy See would be approached. As Dom Fernand Cabrol points out, the system of calendar reform could be introduced in 1939 without any dislocation, because Sunday happens to fall on January 1 that year.

"We can only hope that some agreement may be reached before then so that this long-needed reform of the calendar and the stabilization of Easter may be introduced, to the great advantage of the world, in 1939."

SPEECH BY ARCHBISHOP OF CANTERBURY

The Lord Archbishop of Canterbury, following Lord Desborough, with the following significant address:[10]

"My Lords, I think we must agree that a very strong case has been made out for calendar reform by the two noble Lords who have spoken, and I am sure we all regard with great admiration the chivalrous devotion which my noble friend Lord Desborough has for many years devoted to this matter. We must not allow its intricacies to affect our sense of its

[8] Sosigenes was the Egyptian astronomer whose advice to Julius Caesar resulted in the initiation of the Julian Calendar.

[9] A special meeting of the Transit Committee of the League could, of course, be called.

[10] Cosmo Lang, Archbishop of Canterbury and Primate of the Anglican Church with its affiliated Communions throughout the world. Educated at Oxford, he ranks, by virtue of his office, immediately after the Royal Family and Ambassadors, and before the Lord Chancellor and Prime Minister. The Archbishop attended King George V at his death and it will be his duty to officiate at the Coronation of King Edward VIII. . . . The significance of the Archbishop's address is that he has always been known as a man of conservative temperament in all matters of tradition. His approval of calendar reform is thus a departure from his usual attitude. The speech is also the first authoritative pronouncement in favor of calendar reform on behalf of the Anglican Church. It is thus of the utmost importance that the Archbishop should have used such phrases as "I have found it impossible to resist the plea for reform," "I associate myself with everything which has been said by Lord Desborough on the importance of the undertaking," and "I think it would be a real misfortune if this matter were allowed to drift beyond October this year."

importance. I approach it myself with no sort of enthusiasm. When a subject enters the region of arithmetic my mind ceases to be able to follow it. (*Laughter.*) Nor have I any great belief in the value of uniformity as such. On the contrary, much is to be said for variety.

"Constitutionally, I have a great dislike of any proposal to change long and well-established customs unless there is very strong reason. But I am bound to say that I have found it impossible to resist the plea for reform in this matter, which comes, I think it may be said, with practical unanimity from the representatives of all the great organizations of trade, industry and commerce throughout the civilized world.

"The matter has been complicated, as noble Lords have pointed out, by its immense complexities, including the vagaries of the moon, and it is something, at any rate, in the way of bringing order into this confusion that the League of Nations Committee—oddly enough described as 'Transit and Communications'—have sufficiently cleared the issue to put two alternatives before the world: the alternatives of the equal months or the equal quarters. I express no opinion as to the merits of these two alternatives, but I associate myself with everything which has been said by the noble Lord on the importance of the undertaking of this section of the League of Nations, the Transit Section, to give a definite recommendation, after consulting with all the experts who are available, as to which of the two plans it recommends. I think it would be a real misfortune if this matter were allowed to drift on beyond October this year, when it could not be fruitfully considered again until 1940.

STABILIZATION OF EASTER

"But, my Lords, I rise merely to say a word or two about that aspect of the problem with which I am concerned: the stabilization of Easter. The noble Lord, Lord Desborough, has reminded your Lordships that in this matter we have a rather special responsibility, because there stands on the Statute Book of this country an Act, the Act of 1928, definitely fixing Easter as to be observed on the first Sunday after the second Saturday in April. It is true that part of the Act provides that it shall not come into operation except by an Order in Council, which shall not be issued unless the various religious authorities have been consulted. I think that was a very wise provision. I do not think we can contemplate with equanimity a great variety among the Christian communities of the world in the observance of Easter. Heaven knows there are already sufficient divisions, and we do not want to increase them. It therefore seems to me that it might be expedient if once again I were to remind your Lordships of the position in which the matter still stands as regards the consent of the religious authorities. I am afraid that some of your Lordships would prefer to put it 'standstill,' and I doubt very much whether

even the important communication made by the noble Lord, Lord Desborough, carried it very much farther.

"The position is this: As regards the Anglican Community there is no difficulty. After the passing of the Act of 1928, as was only fitting and proper, there was concurrent action on the part of the Church, and the Convocation of Canterbury in 1929, followed by the Upper House Convocation at York, resolved that in the event of general concurrence among religious communions being obtained for the objects of the Act, Easter Day should be the one specified in the Act; the first Sunday after the second Saturday in April. Again, in 1930, I had the advantage of consulting the Metropolitans and Presiding Bishops, including the Bishops from the United States of America, assembled in the Lambeth Conference, and they were unanimous in saying that they saw no difficulty in principle, but they attached the greatest importance to the previous consent of the leading religious communions in the world having been obtained. There, so far as the Anglican Church is concerned, the matter rests. There was a conference of the League of Nations in 1931 to which I was invited to send a representative; I did so, and they are in possession of the facts which I have just mentioned.

"As regards the Orthodox Church, I wish I could be as sanguine as the noble Lord who has just spoken. It is true that as long ago as 1924 the then Œcumenical Patriarch professed himself ready to pronounce in favor of calendar reform and of a fixed Easter, but since then nothing further has been done. One of the difficulties, and one which is continually recurring in other connections, is that, mainly for political reasons, the autonomous churches of which the Orthodox Church is composed find it almost impossible to assemble and come to any binding decision.[11] As regards the Protestant Communion, we have known some years ago that the League obtained assurances from no less than 82 various Churches and federations in favor of calendar reform and a fixed Easter.

"There remains the great Roman Catholic Communion—in this matter one of vital importance, as it is the largest and most widespread of all. I doubt very much, valuable as is the communication which the noble Lord has made, whether it carries us very much farther. I think it only shows that the Holy See is perhaps returning to the position which was taken in 1921. In that year my predecessor read a letter to your Lordships from Cardinal Bourne, some of which perhaps it is pertinent to

[11] This is hardly a full statement of the case. The present position is that the Eastern world has adopted the Gregorian reckoning with the exception of Bulgaria, Poland, Jugoslavia and Jerusalem where, however, the civil use of the Gregorian Calendar is customary. The Eastern Orthodox Church, through its official representatives, has indicated a desire to find a solution of these differences in The World Calendar which, of course, includes the stabilization of Easter and would embrace the whole community. An official statement of the case was made by Professor Eginitis as the representative of the Eastern Orthodox Church of Constantinople in a report, dated June 23, 1931. . . . The difficulties indicated by the Archbishop are merely incidental to the disturbance of ecclesiastical procedure since the World War. Orthodox opinion is thoroughly united in support of The World Calendar.

read again. The Cardinal, it should be said, was not writing officially:

> I have reason to think that the attitude of the Holy See is one of willingness to sanction the proposed change [that is, the stabilized Easter] provided there be a practically unanimous request to that effect from the principal Governments of the world. I do not think there is any likelihood of the Holy See taking any initiative in the matter.

Since then I think it would be true to say that the Holy See was rather less than more inclined to advance in this respect. I acknowledge the importance of the communication, which has just been read, by a very distinguished and eminent scholar and divine, but your Lordships noticed that there was no intimation of the real effect which it had upon the policy of the Vatican. I can only hope that the Vatican may be reverting to the attitude which was described in 1921 by Cardinal Bourne.[12]

"If, therefore, the request which has been made to the Government is carried out, if this country gives a strong lead to the League of Nations Transit Section to come to some decision between these two alternative schemes of calendar reform, and if in October of this year the Quadrennial Conference can register a general agreement on this matter among most of the principal communions of the world, then I hope it may be possible for the Vatican to reconsider its hitherto generally expressed attitude. If so, then I hope[13] that my noble friend Lord Desborough may be still alive to see the fruition of his long labors!"

STATEMENT BY BRITISH GOVERNMENT

After these speeches, the Government spokesman, the Earl of Feversham, rose to reply on behalf of the Government.[14] He said:

"My Lords, I am sure that your Lordships have listened with interest,

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[12] The report of the Cabrol Mission (June, 1935) on the present attitude of the Vatican was as follows: (1) The subject of calendar reform is under constant consideration at the Vatican, and close observation is being kept of the movement for reform throughout the world. (2) The subject of calendar reform is viewed by the Vatican as a whole, and the question of Easter stabilization cannot be detached from the question of general reform. (3) Before any action by the Holy See can be contemplated, it is in the highest degree desirable that unity should be established between the advocates of differing methods of reform, or, failing unity, the expression of an overwhelming opinion in favor of one system. (4) Such agreement upon a definite method of revision should have formal approval from the leading governments which, through the League of Nations, have already pressed for reform. If such an agreement is reached, and the Nations were to present the Holy See with a request that the Holy Father should examine the question, it is probable that the request would be welcomed. But until such agreement has been reached on a definite plan, it would be unwise for the League or governments to again approach the Holy See for an official decision. (5) It is desirable to make clear that the demand for calendar reform is not prompted by any sectional interests, but is universal. (6) The Mission satisfied itself that opinion in the Vatican is in favor of a 12-month system, and is averse to a 13-month year.

[13] This concluding sentence of the address again emphasizes the decisive attitude taken by the Archbishop on behalf of the Anglican Church in reference to the immediate adoption of calendar reform. It will be realized by all readers that the Archbishop is speaking *officially* from his seat in the House of Lords.

[14] Earl of Feversham—Charles William Slingsby Duncombe—Lord-in-Waiting to the King. . . . A fair interpretation of his reply is that the Government favors The World Calendar —not only in principle, but as a definite and detailed proposal. With The World Calendar on the table, the Government indicates a readiness to welcome development in the direction of reform, along these specific lines. This is the first time that a British Government has ever granted such an endorsement of any general proposal to reform the calendar. Lord Feversham's statement indicates definitely what (according to present intentions) will be the instructions issued to the British delegation at the next League of Nations meeting dealing with this subject. The significant phrase in his address is the concluding one—that if the matter is placed upon the Agenda at Geneva [it already has a place on this Agenda], the whole question will have the most *sympathetic* and serious consideration of His Majesty's Government.

if not with sympathy, to the argument so precisely put forward by the noble Lord who moved this Motion, Lord Merthyr, and so loyally supported by Lord Desborough. In view of those arguments perhaps it would be of service to your Lordships' House if I were briefly to enumerate the initiative and activities of this country in the consideration of the question of the reform of the Gregorian Calendar. Reference has been made to the Advisory Committee for Communications and Transit of the League, which in 1923 appointed a special Committee to consider the reform of the calendar. This Committee reported in 1926, and dealt separately with the reform of the calendar and the stabilization of Easter. They considered, as Lord Merthyr had informed us, no fewer than 185 various schemes for the reform of the calendar, and in their Report they referred to three schemes, two of which had been given attention both by Lord Merthyr and by Lord Desborough.

"I think it would be unnecessary for me to go into the merits or otherwise of these specific schemes, except merely to refer to the circumstance that in both schemes in ordinary years, as has been pointed out, there would be a blank day, but in this year of 1936 there would be two blank days, owing to the fact that it is leap year. I do not wish to state an opinion to this House as to whether that would lead to confusion or not in the minds of many British citizens, but the fact remains that confusion would no doubt arise, especially when leap year arrives. A point, however, that I think is of extreme importance, is that although the Committee considered these schemes they did not decide in favor of any particular scheme. They reported that although powerful propaganda movements were on foot, public opinion was not yet prepared, even if it welcomed reform, to press for immediate action in any particular direction. When the Report was considered by the Assembly of the League, the Assembly suggested that the examination of the question of calendar reform should be coordinated and organized in each country by national committees of inquiry on official or semi-official lines. Therefore in September, 1930, an official British Committee of Inquiry was constituted, to ascertain 'whether and in what form public opinion holds calendar reform to be desirable or possible.' This Committee was presided over by the late Lord Burnham, and reported in May, 1931.[15]

"Of the activities of that Committee it is worth mentioning to your Lordships that it circularized 499 industrial and commercial bodies, but received replies from only 64. Of these, 29 expressed 'no opinion' in various terms, and only 23 out of the 499 expressed themselves as favorable to reform. It had further circularized 62 professional organizations, of which only 25 replied. Sixteen stated that they had no interest, five

[15] Lord Burnham was the proprietor of the well-known newspaper—*The Daily Telegraph* of London.

were opposed to change, two were in favor of change, and two were in favor of a fixed Easter. I think it was particularly significant that the chartered accountants had no opinion to offer at all, and that the Committee of the British Bankers Association concluded that no sufficient reason had been advanced for a change. Further, the Committee consulted the Association of British Chambers of Commerce, the executive council of which declared themselves as not in favor of calendar reform. The National Council of Women of Great Britain was also opposed to change. Therefore your Lordships will observe that from the Committee's Report it was clear that, in their words, the prospect of the acceptance of a 13-month calendar by British public opinion is, for at least a good many years to come, very slight, and that there is no widespread discontent with the existing system.[16]

13-MONTH CALENDAR DISAPPROVED

"This matter was further considered by an unofficial Parliamentary Committee, whose principal conclusion was that a 13-month calendar was, in their words, definitely repugnant to British feeling.

"The noble Lord, Lord Merthyr, has referred at some length to the general question of calendar reform as it was considered by the Fourth General Conference on Communications and Transit, held in 1931. The Conference then adopted a Resolution concerning the economic and social aspects of the simplification of the Gregorian Calendar, which stated:

> The Conference was almost unanimous in coming to the conclusion that the present is not a favorable time . . . for proceeding with a modification of the Gregorian Calendar. The Conference . . . did not think fit to express any opinion on the principle of calendar reform.

I was rather surprised, having known of that Resolution passed by that Conference, that the noble Lord should have devoted so much time during his remarks to the proceedings which took place within that Conference.

"So far as His Majesty's Government are aware there is no very substantial demand in this country for a radical reform of the calendar. In fact the Government have been aware of considerable opposition to the proposal. Although the Trades Union Congress passed, in 1928, a resolution to the effect that the time is now ripe for calendar reform, the Federation of British Industries has informed my right honorable friend the Home Secretary of its opposition to the general reform of the calendar. I think it would be useless for me to say much concerning the position of the Churches, especially as regards the Anglican Church, as the House has had the advantage of hearing the views of the most reverend Primate. But the Report of the Unofficial Committee said that the Anglican Church would only agree to a change if it did not cause a difference of practice among Christians; while the Roman Catholic Church

[16] This pronouncement ends any prospect of seeing an adoption of the Thirteen-Month Calendar by the British Empire.

would not sanction any change unless there was overwhelming evidence from all nations of an almost universal desire for change. That was contained in the Report of the Unofficial Committee, who were in a position to have evidence to that effect. The Jewish community, I understand, are opposed to calendar reform that interferes with the religious week.

"Your Lordships will perceive that in those circumstances, with the facts that have been brought to the notice of those who have had to inquire into the matter, it would be difficult for His Majesty's Government to agree to the proposal made by the noble Lord that His Majesty's Government should take a lead in bringing the question before the Committee for Communications and Transit.

"But I can assure your Lordships that, if the matter were to be placed upon the agenda of that Committee, the whole question of the reform of the Gregorian Calendar and the stabilization of Easter would have the most sympathetic and serious consideration of the representatives of His Majesty's Government who attended that Committee.

"I am afraid that I have not by any means satisfied the noble Lord who moved this Motion, but I am sure your Lordships will appreciate that, from the evidence that has been submitted, there is no definite demand for a change at present. In those circumstances the Government feel that they cannot go to the lengths which some of those who have taken part in the debate today would wish them to go."

CLOSING REMARKS BY LORD MERTHYR

Lord Merthyr closed the debate[17] with a few additional remarks:

"My Lords, although the noble Earl has rightly perceived that he has not satisfied me in the reply which he has given us, I should like to take this opportunity of thanking him for the trouble he has taken in the matter. He spoke of the confusion which it is alleged would be caused by the second blank day in leap years, but it comes as a surprise to me to learn that the British public would in any way object to the extra holiday which that would involve, because those blank days would of course be national holidays. He also said that he was surprised that I dealt at such length with the last meeting of the Communications and Transit Section. The point I wanted to make was that it was hardly surprising that such a negative result should have been arrived at after the very indecisive, and indeed nebulous, contribution made by the British Government. I feel, as many others do, that if the British Government were to give a lead and set an example the result would be very different."

[17] The debate ended in the manner usual after such discussions. The "motion for papers" was by leave withdrawn. This does not mean that calendar reform suffered a set-back, but merely that the debate had served its purpose. The position now is that the British government—"most sympathetic" to the "whole question" of The World Calendar and Fixed Easter—will give "serious consideration" to whatever possibilities arise.

EASTER AND THE CALENDAR

By THE RIGHT HON. LORD DESBOROUGH, K.G.

(From The Spectator, March 20, 1936)

INCONVENIENCES of a shifting Easter are becoming more realised every year. In 1940 Easter Sunday will be on March 24th, within two days of the earliest possible date, and in 1943 it will be on April 25th, which is the latest possible date. This will affect the Law Terms, the University Terms, the School Terms throughout the country, and the great holidays of the people of Easter and Whitsuntide. It will also affect Banking, Finance, Trade, Commerce and Industry, as well as Railway and Shipping concerns.

An oscillating Easter, again, vitiates comparative statistics owing to the irregularities in the occurrence of the Easter Holidays. Our financial year dates from April 6th to April 5th, and in twenty consecutive financial years there were six which had one Easter Holiday, seven which had two Easter Holidays, and seven which had no Easter Holiday at all.

Easter Sunday is fixed in accordance with the wonderful tables drawn up by Clavius for Pope Gregory XIII, when he reformed the Julian Calendar in 1582, the principal object of which was to eliminate the error of ten days which had accrued owing to the Julian year of 365¼ days being too long by eleven minutes twelve seconds. Easter was unfortunately not stabilised at the same time, but was made dependent on the "ecclesiastical" moon, a device used by Clavius in drawing up his tables. Christmas Day, which celebrates the birth of Our Lord, is fixed in the Solar Calendar, while Easter, which commemorates the Death and Resurrection, wanders about over a space of thirty-five days.

Congresses of Chambers of Commerce, International, Imperial and National, and important bodies representing Education, Law, Trade, Industry and Commerce have for many years voted resolutions in favour of a fixed date for Easter, and a Bill was passed through both Houses of Parliament which became the Easter Act of 1928. This Act provides that Easter should be the first Sunday after the second Saturday in April, and these words are used instead of the second Sunday to prevent Passion Sunday falling on Lady Day, as sometimes happens now.

This Act can be put in force by an Order in Council, but there is a wise proviso that before the draft order is made "regard should be had to any opinion officially expressed by any Church or other Christian body." The opinions of the leading Churches and Christian bodies have in fact been ascertained, and there has been found to be an overwhelming desire for the establishment of a stabilised Easter by common consent. The Church of Rome, however, though it has pronounced that no question of dogma

is involved, has intimated that sufficient cause must be proved before the practice of centuries is altered with its approval.

The reform has nevertheless been advocated by many eminent Roman Catholics. Many years ago the Roman Catholic Bishop of Salford wrote these words with regard to the stabilisation of Easter: "The dogmatic dangers and difficulties of the early centuries involved in the change of the Paschal calculation are no longer existent, and there can surely now be no objection from the theological point of view."

In June, 1935, another high authority of the Roman Church, the Right Reverend Fernand Cabrol, Abbot of St. Michael's Abbey, Farnborough, headed a mission to Rome to ascertain the attitude of the Vatican toward the proposals for a fixed Easter and Calendar Reform. The mission was organized by the Rational Calendar Association of London and supported by leaders of delegations from a number of similar organizations in Europe and America.

A more fitting head for such a mission than Dom Fernand Cabrol could hardly be found, as he has written more than twelve books in French on the liturgy and ecclesiastical history, and many books in English on the Mass, Liturgical Prayer and kindred subjects, besides being an Editor of the great Dictionnaire d'Archéologie Chrétienne. This learned ecclesiastic presented a memorial in Latin in favour of a fixed Easter and a reformed twelve months Calendar of equal quarters, which was placed on record in the official archives of the Church.

As a result of numerous conferences which were held in Rome, the Mission came to these conclusions, among others, namely, that (1) the subject of Calendar Reform is under constant consideration at the Vatican, and close observation is being kept of the movement for the reform throughout the world, (2) the subject of Calendar Reform is viewed by the Vatican as a whole, and the question of Easter stabilisation cannot be detached from the question of general reform, and (3) the Vatican would be very unlikely to look with favour on a thirteen-month year. It would thus appear that the two great questions of the Fixing of Easter and the Reform of the Gregorian Calendar should be taken together, and such a policy would have great advantages.

The League of Nations has taken up the consideration of Calendar Reform, and great progress has been made through commissions set up in different countries. A very large number of schemes have been examined, and two have survived the ordeal, namely, a 13-month year of 28 days, and a 12-month year with equalised quarters. Both of these systems would produce a permanent perpetual Calendar.

The 13-month year would provide equal months of 28 days each, but necessitates the introduction of a new month to be called Sol, a proposal which, as was made clear by the Government spokesman in the recent House of Lords debate, has not been received with much enthusiasm in this country. The "Equal-Quarter" Calendar would have 91 days in each quarter, the year would always begin on Sunday, January 1, and end on Saturday, December 30. The first month of each quarter, January, April, July and October, would have 31 days, and the other months 30.

The present year is of the greatest importance in the history of this movement. The relevant Committee of the League of Nations meets next October, and as at present constituted does not meet again for four years. In 1939 the year begins on Sunday, January 1, and this does not happen again till 1950. If the League of Nations approved of the proposal to fix Easter and reform the Calendar, the various Governments could be approached and the result laid before the Holy See. It is to be hoped that the Government will instruct its representative on the Committee to support a moderate Reform of the Calendar, which would include a fixed date for Easter, and the new Calendar might then be put into operation in 1939.

DESBOROUGH'S LEADERSHIP

By ELISABETH ACHELIS

President, The World Calendar Association

ON MARCH 4, 1936, the British government formally announced its advocacy of calendar reform. The announcement was made quietly with the restraint of official language, from the floor of the House of Lords. It stated that the British delegates at Geneva would give "most sympathetic" consideration to the question of calendar revision which is scheduled for submission to a League of Nations commission this fall.

The government commitment was so worded that its full significance was lost to many of the listeners, as it may even be lost at first reading to many of those who only give a cursory glance at the official text.

But its significance was not lost to Lord Desborough, the persevering leader whose steady devotion to the cause of calendar reform has at last won for him the prospect of victory which he so richly deserves. He correctly viewed the announcement as his government's official declaration of policy in favor of a revised calendar.

Lord Desborough's interest in calendar reform dates back prior to the World War, when he became interested in the beginnings of the movement on the Continent. He followed its early development in Switzerland and Germany. Then, after the war, he saw it reappear, and he sought to enlist British support in Parliament as early as 1920 and 1921. Finding that British interest was more stirred by the possibility of a fixed Easter than by the more comprehensive suggestion of general calendar revision, he decided to campaign, for the time being, on Easter stabilization as a first stage in the larger reform. He slowly won the hesitating support of British leaders in church and state. At parliamentary hearings in 1920 and 1921, he saw the Archbishop of Canterbury give a qualified approval of his plans regarding Easter. Eventually in 1928, after nearly a decade of adroit and energetic campaigning, he brought the Easter project triumphantly to the floor of Parliament and obtained for it the full approval of both legislative houses. Great Britain's Easter Act was, in fact, the first actual legislation by any country on the subject of reforming the Gregorian calendar.

Eight years passed, however, before Great Britain was ready for the next step, which resulted in the commitment given by Lord Feversham, as government spokesman, in the recent House of Lords debate.

The progress which was made with the British people during the intervening years is indicated by the complete support given to Lord

Desborough on this later occasion by the Archbishop of Canterbury. No qualifications accompanied the Primate's official utterance, which, aside from its hearty endorsement of his colleague's viewpoint, was mainly a considered and thoughtful appeal to the other great churches of Christendom to join in the enactment of a new calendar before 1939.

Lord Desborough, at 81, is a British peer who has many ties of friendship and understanding throughout the world. His pre-eminence as a sportsman and as a business leader, aside from his family connection with the Morgan-Grenfell banking house, have helped to make him known in America. As a young man, he climbed the Rockies, swam twice across the Niagara River, and endeared himself to Americans by his prowess and daring. Turning to business, he proved himself the kind of an "organizer" that Americans understand and admire. For the greater part of his business life he was easily the outstanding personage in the Chamber of Commerce movement in England and a familiar figure at international business conventions. Active in politics, he entered public service as William Henry Grenfell, member of the House of Commons, rising later to a peerage and engaging actively in duties on many government committees and public bodies.

Fortunately for the cause of calendar reform, Lord Desborough has never thought of "retiring," even after four-score years. The picture shown as the frontispiece of this Journal is a recent one, given to the writer on the occasion of a conference on calendar reform at his Lordship's summer home near Norfolk.

For more than twenty years, he has zealously watched and studied the currents of thought and action that are leading the world today toward an improved calendar. He early realized that the process was a gradual one, that there were obstacles of tradition and usage to be patiently met, without violence or irritation, and that the situation called for persistent and prolonged educational efforts.

He watched the movement for a new calendar grow up in the Eastern Orthodox Church, and was encouraged by the leadership of Prof. Eginitis of Greece, who came to be the official representative of the Ecumenical Patriarchate at all important conventions and conferences dealing with this subject. No less hopefully did he observe the growing sentiment in the Roman church for an improvement in the Gregorian system which was foreseen and hoped for by Pope Gregory 354 years ago.

The part that the churches must necessarily play in any effective international agreement on the calendar was clear to him. He did not unduly urge his own church to action, for he knew that a "level" front was more important than the spectacular advance of an individual unit.

Meanwhile he pursued his activities on the civil side—in governmental, commercial and scientific bodies. There were other earnest leaders, too;

and Lord Desborough was the last man to claim sole prerogative of leadership when there were others who were competent, able and willing to guide and direct the movement.

In the early 1920s, the various international activities for calendar reform focussed themselves on the League of Nations. The currents which converged at Geneva included the Swiss government, long an active proponent of calendar reform, the International Astronomical Union, which had early taken the scientific leadership of the cause, and the International Chamber of Commerce, representing business and commercial relationships. Out of these (in none of which Lord Desborough had been entirely absent) grew the organization of a special League committee of inquiry in 1923. On this committee were representatives of the three leading religious groups, seeking to clear the ground completely of dogmatic difficulties. Rome, Constantinople and the Protestant group (represented by the Anglican delegate) agreed in a definite and binding commitment that "no dogmatic obstacle stood in the way of calendar revision." This may have seemed a negative progress to many over-ardent advocates of reform; but to Lord Desborough it was signal progress.

By 1931, the nations were ready for their first formal international convention on the subject. Delegates of 44 nations participated in the lengthy deliberations, which again resulted in a kind of progress which seemed negative to many, but which a more discerning eye could see was another necessary step in clearing the ground for definite action.

That this action will come in October of this year is the hope and belief which was confidently expressed in the House of Lords debate by both Lord Desborough and his strong supporter, the Primate of the Anglican Church. Whether at the postponed quadrennial session of the Commission on Communications and Transit, or at a special meeting called for this express purpose, there can be little reason to doubt that calendar reform will come up for international consideration. And the formal statement of the British government, made through Lord Feversham in answer to the motion of Lord Merthyr, assures the world that Great Britain will stand four-square in a "most sympathetic" and serious support of the new calendar which is advocated by Lord Desborough and a host of far-sighted men and women the world over.

Lord Desborough supplemented his address in a letter published prominently in the London Times on March 14, in which he says:

"To the Editor of the Times

"Sir,—In the debate on the Calendar in the House of Lords on March 4, I rejoiced to hear so powerful a voice as that of the Archbishop of Canterbury lifted in support of the plea that the Government should give a definite recommendation to the League of Nations Committee which is to reconsider the question of calendar reform this autumn.

"The case for reform has long been prejudiced by the fact that, of the two schemes

selected by the League Committee for final consideration, the plan for dividing the year into 13 months (including a new month called 'Sol' to be inserted between June and July) has till lately received the greater publicity. Most people, however, will agree with Lord Feversham, who, in replying for the Government, quoted from the report of the unofficial Committee on Calendar Reform (1931) the conclusion that a 13-month calendar was 'definitely repugnant to British feeling.'

"The alternative scheme, which, by a slight rearrangement of the days of our present calendar and by treating one day in the year as a day apart, would establish a perpetual year of four equal quarters, is favored by a substantial body of responsible opinion not only in this country and the United States but in many other Christian countries throughout the world.

"It would appear that the active opposition to reform which was mentioned in the reply of the Government was really opposition to the 13-month scheme, and that the allegations of public apathy on the question, although true of 1931, when the Burnham Committee of Inquiry reported, are much less true to-day. Such a subject as this cannot, of course, be expected to excite the passionate interest of the general public, but it is a fact that many responsible bodies, beginning with the International Chamber of Commerce, which has repeatedly pressed for action, and including in this country many leading chambers of commerce, the National Chamber of Trade, and the Trades Union Congress, have passed resolutions in favour of a moderate scheme of reform. It is within my knowledge that many of these resolutions have been forwarded to the Home Office, though they appear not to have been brought to the notice of Lord Feversham before the debate.

"It is satisfactory that the Government has promised that the question will have the most sympathetic and serious consideration of their representatives at Geneva when the relevant committee considers the matter this autumn. The universal desire in this country for a stabilized Easter has been expressed by the passing through both Houses of the Easter Act of 1928, but pending the general assent of all the Christian communions, which is plainly an essential preliminary, that Act has never been put into operation by the Order in Council required. The movement for a general reform of the calendar has recently developed so widely that the two aspects of reform have now become inseparable. In a fixed calendar, of course, the date of Easter would be stabilized not only on a particular Sunday but also on a particular date in the year.

"Clearly the Government's attitude must be determined in the main by the weight of public opinion behind the movement for reform, and I may perhaps be allowed to express the hope that interested organizations will take the opportunity to acquaint themselves with the questions at issue. These are not by any means so complicated as they have been made to appear, but it is obviously not possible to expound the case for reform and to present the scheme for a fixed calendar within the limits of a letter. There has been published a small booklet explaining the very simple measures proposed, and I should be happy to see that a copy is sent to anyone who applies to me for it.

I am, &c.,
DESBOROUGH.
Taplow Court, Taplow, Bucks."

BALTIC REPUBLICS WANT ACTION ON CALENDAR

ANNOUNCEMENT was made from Geneva on March 18 that the Government of Estonia has declared itself officially in favor of calendar revision, advocating the 12-month equal-quarter reform and the stabilization of the Easter date. It notified the church authorities in Estonia of its action, and asked their approval and endorsement, which has been given. It is expected that the governments of the other Baltic republics will take similar action immediately, as a result of the close collaboration which has been established between them during the past few years.

PASSING OF THE PATRIARCH

By Charles D. Morris

NOTABLE impetus has been given to the cause of calendar reform during the past decade by the leadership and support of the Eastern Orthodox Church, and the death of His Holiness Photios II, the Ecumenical Patriarch, will be mourned as a distinct loss to the cause of revision.

The Patriarch, Photios Maniatis, was elected to his high office in 1929, and the subject of calendar reform came to his personal attention almost immediately. He approved the appointment of Professor Demetrius Eginitis of Athens as his official delegate and spokesman at various international conferences where the church desired to be represented. These culminated in the meeting called by the League of Nations in 1931, regarding which Professor Eginitis submitted a formal report, later published in Ortodoxia, official organ of the Ecumenical Patriarchate. This has since come to be regarded as the expression of the considered attitude of the Orthodox Church. The essence of the report is as follows:

"I, myself, as the representative of the Church at Constantinople, supported the 12-month equal-quarter plan and the stabilization of Easter in the committee of the League of Nations. The opinion of the various churches is that it can be successful, because it involves no question of dogma or canonical principle."

The Patriarch was a man of wide learning and unquestioned scholarship. The researches which were made into the whole question of calendar reform were regarded by him as of high importance, particularly in view of his paramount interest in church unity, both within his own faith and among the other great churches of Christendom.

This interest was evidenced in correspondence with secular calendar reform organizations in New York, Geneva and elsewhere, as well as with the officials who dealt with the subject in the League of Nations, in the international church organizations, and among the autocephalic churches of Orthodox countries.

The Patriarch also received in audience leaders of the calendar reform movement who visited his palace in Istanbul for this purpose. Two years ago the Patriarchate received an American delegation which included the President of The World Calendar Association.

His Holiness Photios II had great personal dignity; the first Patriarch in more than 1000 years to bear the name Photios. He died in his 62d year, on Sunday, December 29, 1935, after a long illness.

The Patriarch's domain is Phanar, Golden Horn suburb of Istanbul, and by government requirement he must be a Turkish citizen. However, only

five sees in Turkey have remained subject to him, along with four in the Italian Dodecanese, one in Prague for Czecho-Slovakia, one in Sydney for Australia, one in New York for North and South America, and others in Finland and Estonia. Shortly before his death he gave the church of Latvia its autonomy. The larger units of the church, including those in Egypt and Palestine, Yugo-Slavia, Roumania and Greece, were already autonomous.

Owing to this autonomy, it has been necessary in considering the general attitude of the Eastern Orthodox Church on calendar reform, to remember that the Patriarch had no power to legislate in such a matter, but merely to act as the head or president of the various autocephalous churches. An actually binding decision, either in regard to Easter stabilization or in regard to general calendar reform, requires action either by an Ecumenical Synod or by a Pro-Synod.

However, the leadership of the Patriarchate has been clear and emphatic, and the attitude of the autocephalous churches has been fairly well defined during the period that has followed the Eginitis statement of 1931. It is agreed that no question of dogma is involved, and there has been no opposition to Easter stabilization, provided that it is based on a general agreement of Christian churches. There has been no adverse criticism of Professor Eginitis' report in support of general calendar reform of the 12-month equal-quarter type.

The Patriarchate's position on calendar reform has been supported also by all the important non-Orthodox churches of Christendom. The Vatican has indicated its sympathy and interest in the movement and has officially communicated to the League of Nations its decision that there is no dogmatic objection. The Universal Christian Council, the official congress of non-Roman churches, has established a standing committee charged with the sole duty of promoting the cause of calendar reform, and the Eastern Orthodox Church has officially designated members on this committee.

Thus the churches of the world are seen uniting, perhaps for the first time in history, on the advancement of a particular cause. This fact alone, as the Patriarchate has pointed out, gives calendar reform high significance—in its bearing on church unity—to the whole of Christendom.

The approval and patronage of the Patriarchate has resulted recently in the publication of an exhaustive and scholarly monograph written by the Archbishop of Athens, dealing intensively with the whole subject of calendar reform within the Eastern Orthodox Church. An abstract of this work was printed in English, a few days before the Patriarch's death, by the Journal of Calendar Reform.

The Archbishop's researches indicate that the interest of the Orthodox Church in calendar revision came sharply to the front beginning in 1919, when a special commission was appointed by the Holy Synod. The report of

this commission urged the adoption internationally of an improved calendar "more scientifically accurate and not suffering from the defects of the two calendars now in use, Julian and Gregorian."

A year later, in 1920, the Patriarchate declared that "a definite revision of the calendar is imperative." A new commission was appointed to promote the change, and the members of that committee became, during the next decade, acknowledged world experts and leaders on this subject,—Professor Eginitis of the University of Athens, Professor Chrysostomos Papadopoulos (now Archbishop of Athens) and Professor H. Alivisatos, now the leading representative of the Orthodox Church in its relations with the western world. Coupled with this group should be mentioned also the Archbishop Germanos of London, who has taken an eminent part in presenting his church's views on the calendar to the Church of England, the Federal Council in America, and the various continental church groups.

It was through these church leaders that Photios II carried the Patriarchate's views on calendar reform to the outside world, and ably advanced it toward its ultimate goal of realization and enactment.

TIME TO CHANGE

By W. K. Herrick

(Address at the Rotary Club of Cherokee, Iowa)

SINCE man first emerged from his savage state, there has been a series of attempts to improve the method of recording the passing of the days. The calendar has been revised several times in recorded history, and there is nothing unusual or revolutionary in changing it. Julius Caesar gave us our present calendar; Pope Gregory made some improvements on Caesar's system.

Merely because of man's inertia, we are still using a calendar which is cumbersome and inefficient. Some of its irregularities are merely survivals of the personal egotism of two Roman emperors who died nearly twenty centuries ago.

Nations have been debating for 50 years the question of making a change in our antiquated calendar. Its inequalities and variations have become a real handicap to modern business. The matter is one of immediate and practical international importance.

Among the disadvantages of the present calendar, a familiar one is the difficulty of adjusting industrial and educational schedules to the vagaries of wandering holidays. Another is the impossibility of making accurate statistical comparisons between one period and another.

The type of revision which will probably be adopted is a 12-month equal-quarter plan known as The World Calendar. Some years ago a 13-month calendar was proposed, but its inadequacy in meeting the needs of modern business aroused such violent opposition that it has been dropped by many of its former advocates.

SPEAKING OF LEAP YEAR

By PROFESSOR HARLAN T. STETSON

Harvard University

(From This Week Magazine, February 16, 1936)

FATHER TIME declared an extra dividend in February this year. Leap Year it is—and the customary opportunity for aggressive feminine aspirants to speak for themselves.

Did you know there is a possibility that this may be the last year February will have just twenty-nine days? Not that it is going to be deprived of its extra day, but rather that the month may be put on a more equitable basis with the other months of the year.

This is the plan of large groups of people who are sponsoring a revision of the calendar. It has now been officially supported by resolutions passed by five national scientific bodies, by the Chamber of Commerce of the State of New York and by the Assembly of the Protestant Episcopal Church.

The change in reckoning will be so slight when it takes place that you will hardly know the difference except at the end of the year, when you will have a grand holiday preceding New Year's Eve, called the "Year-End Day." It will be neither the last day of December nor the first of January.

The easiest kind of year to make this change will be a year when January 1 falls on Sunday. The next opportunity, therefore, will be 1939.

A conference is likely to be called by the League of Nations this year to consider the matter. If the change should be made in 1939, then never again will February be restricted to twenty-eight or twenty-nine days; it will have thirty days every year. Leap Year will bring an extra day, but it will be at the end of June.

Do you know where our present calendar came from or how terribly irregular it is? Civilization has been putting up with a confusion in time reckoning for many thousand years. If you think calendar making is easy, just try to satisfy the man who wants his day to be governed by the sun, the month by the moon and the year by the seasons! The earth turns on its axis every twenty-four hours. That makes the day. The moon goes about the earth once every twenty-nine and a half days, so you just cannot make a month out of an even number of days or weeks. Then, the earth goes around the sun in just a bit short of three hundred and sixty-five and one quarter days. Even the year cannot equal a whole number of days!

In the days of the Roman Empire, when Julius Caesar was elected Pontifex Maximus in 63 B.C., he was charged officially with straightening out the calendar, which was then so badly out that spring was not coming until the end of May. The Romans at that time were not very good scientists. They were putting too many days into the year, and it was the ac-

cumulated troubles of all this that Julius Caesar was asked to straighten.

Caesar was no astronomer, but he had week-end attractions down in Alexandria, Egypt. He learned a few things down there aside from what Cleopatra taught him, and these were some fundamental facts about the movements of the sun. He found that the best astronomical estimate of the year's length at that time was 365 and one-quarter days.

Caesar therefore decided that there should be twelve months containing alternately thirty-one and thirty days each, except for February. Ordinarily February would have twenty-nine days. This would make, then, just 365 days in the year.

Since in this scheme of reckoning the year would be short one-quarter day, in four years it would be one whole day behind. To correct this he would add an extra day to February, making it have thirty days every fourth year. In juggling the odd and even months, he gave the seventh month thirty-one days and named it after himself—"Julius." We translate this into the English "July."

Affairs of the calendar went along very satisfactorily until Augustus took the throne. He decided to change the Latin name of the eighth month, which had been Sextilis, to his own name, Augustus. And he purloined a day off February in order that Augustus (August) should have thirty-one days, the same as Julius (July).

Thus February was shorn of two days. Hence it since has been condemned to twenty-eight days except in leap year.

While the twelve-month calendar constructed under Julius Caesar was the best yet, it subsequently developed that the Julian leap year was a bit too long to even things up. By the middle of the sixteenth century spring came on March 11 instead of March 21.

Pope Gregory XIII took it upon himself to remedy matters; so in the year 1582 he decreed ten days should be dropped from the calendar—October 5 of that year was decreed to be October 15. He also declared that three leap years should be forgotten in each 400 years. That is why 1900 was not a leap year, but 2000 will be one. (To make it easy to remember when to forget leap years, one has only to recall that century years are not leap years unless the century year can be divided evenly by 400.)

This Gregorian calendar does not make things quite right, but the error is so small that it will not accumulate to as much as a day in 3,000 years.

While the Catholic countries generally adopted Pope Gregory's improvement, Protestant Europe did not agree to it until the beginning of the eighteenth century. Great Britain and North America did not make the change until 1752.

The last country to adopt the new style was Turkey, which went modern in 1927. Four years before, a committee was appointed by the League of Nations to consider the reform of our present calendar and the fixing

of Easter. The committee considered and compared 185 plans. In 1931 the League held another calendar conference.

From this international discussion the plan for a perpetual calendar of twelve months divided into equal quarters emerged as one offering the greatest promise for early adoption. This calendar would give us a year of 364 days, divided into equal quarters of ninety-one days each, and an extra day at the end of the year to be called "Year-End Day." On this equal-quarters plan every three months would be alike. The first month would have thirty-one days and the remaining two months of each quarter thirty days. The first of each quarter would start on Sunday. The fourth of July would always fall on Wednesday. School programs and academic schedules would be more constant. Corporations making financial reports would find figures for each quarter based on the same number of working days.

This equal-quarters plan is sometimes called The World Calendar. It is not likely to be adopted until all the principal nations agree upon it, but this may happen sooner, perhaps, than you think. The League of Nations stands ready to call another calendar conference whenever two or three governments request it. Mexico has already gone on record. What country will act next?

FOREIGN ADVISORY COMMITTEE

THREE new names appear this month in the Foreign Advisory Committee of The World Calendar Association, printed on Page 63. Lord Desborough takes a place on the committee, and representatives of Spain and Mexico are added.

Lord Desborough's name and personality are too well known to require detailed mention here, especially as his latest achievement in the cause of calendar reform is the subject of an article in this issue. Don Joaquin Gallo, representing Mexico, is the head of the Mexican official committee on calendar reform, director of the government astronomical observatory, and chief scientific spokesman for his country. Father Luis Rodes, S. J., representing Spain, is the head of the Jesuit Observatory at Tortosa.

Brief mention of the other members of the Committee may be made at this time. Prof. Stroobant is the Belgian government astronomer, and a member of a group of distinguished Belgian scientists who have lately made astronomical history by their discovery of a small heavenly body which recently approached the earth. Mr. Echlin of Canada is now in Europe as the representative of *Time Magazine* and a syndicate of Canadian newspapers; he has an article in this issue. Dr. Blume of Danzig was his government's representative at the 1931 conference on calendar reform. Mr. Hervier of France is the secretary-general of the Paris *Intransigeant*, author of many books and magazine articles, and also a leading factor in motion picture production in France. Abraham Frowein is a German industrialist and former president of the International Chamber of Commerce. Mr. Eason of the Irish Free State is a business and cultural leader in Dublin, head of an important printing firm. Prof. Giannini of Italy is a "Counsellor of State" in the Italian Ministry of Foreign Affairs and Secretary-General of the Council of Diplomatic Law. Mr. Mage of Switzerland is the Geneva director of the international movement for control of narcotics. Prof. Ihsan Ali of Turkey is a professor in the University of Istanbul and diplomatic representative of his country at many international conferences. Dr. Reyes, head of the Latin-American Committee, is a retired Chilean naval officer and former director of the national observatory at Santiago. M. Politis of Greece is a member of a family distinguished in diplomacy and prominent in the League of Nations.

FOR EVERY PEOPLE AND FAITH

By Rabbi Martin M. Weitz

Director B'nai Brith Hillel Foundation, Northwestern University

AS ITS ideal, The World Calendar Association might well have a dual offering to mankind: a World Calendar in Spirit as well as in Time, for every people and every faith. Perhaps a new spirit of social-mindedness and a "reverence for others' reverences" may well result from a calendar that is not only universal in scope but also social in content, for differing world communities—as religion or nation—enjoying their separate "days" in the common comradeship of a World Calendar.

These ventures indeed may become social adventures, may serve not only as a memorial to old ways, but as a challenge to new days. They may serve as the byways if not the highways to new horizons. And no horizon can belittle man as long as man is the horizon-gazer, even as no astronomy can make man small as long as man is the astronomer!

The calendar is a record not only of time, but of mankind's efforts at enshrinement of his experiences, which, by and large, have been and still are in the nature of crises. Crises have ever been nuclear to the calendar of religion. Group and individual crises have been the sources for every festival and ceremony which might have emerged from below the psychic patterns of individual and group. Thus birth, maturation, illness, marriage and death are the crises in the life of the individual and as such have brought forth a myriad of ceremonies and meanings to match personal experiences. Thus it is that baptism and circumcision, confirmation and *bar-mitzvah*, parallels among Jews and Christians, are responses to similar crises in the life of the individual.

Migrations, battles, and crops have ever been crises in the life of a group and from such three situations derive the interpretations for the festivals of all faiths. Perhaps Passover and Easter, as well as Chanukah and Christmas, obtain their unmistakably different meanings from common origins, as original crises later infused with supplementary spiritual values which in time displaced the original notes, though not time-element.

The human race might well be compared to the parable of the Exodus. Mankind is ever moving with a "pillar of light" before it and a "pillar of cloud" behind it, with hope ever before and memory ever after its many crises in the life of the individual and the life of the group.

In the current decade we hear much discussion, not only about the "revision of the calendar," not only about the shifts in social economies, but also about the reinterpretation of social and personal crises. Youth in general is indeed at the crossroads of crises and is looking for a "pillar of fire," even more than for a "pillar of cloud." Like the famous char-

acter in one of Ibsen's plays, world youth wish to come down from the rarefied heights of the cloud-crested peaks where visions are pure and dawns ever demure, and bring their frost-fretted sepulchres of the spirit even to the blasts of industry. They wish to test their ideals in the laboratory of life to find out whether or no they can be powerful as well as beautiful enough for their new setting.

It is in this spirit that we approach the calendar—in an attempt to reinterpret the festivals of the calendar even at the time the calendar itself may be revised. Thus a "revision of the calendar" will have the added value of a reinterpretation of its major "days," so that all of them, as much as possible, bear a social impress. Without violation to their origins, we may supplement them with new social meaning.

We hereby suggest the festivals of the Jewish calendar—since the author knows them best—as an illustration of what might serve as an indication, a point of departure as well as reference, for other great religions which could be interested not only in revision of the calendar, but also in a reinterpretation of their "days" for social advance.

Thus, in the calendar of Judaism, as an example, the New Year (*Rosh Hashanah*) —in the spirit of its tradition and modern need—may have as its vital message *the place of religion in the modern world.* Day of Atonement (*Yom Kippur*), the great day devoted to fasting and also to prophetic readings against such observances—itself an early conflict later enshrined as "balance"—may stress *the remaking of human nature* as its motif. Feast of Tabernacles (*Sukkoth*)—likewise a later "balance" from early "conflict," inasmuch as this festival devoted to joy is accompanied by special reading of a saga of sorrow and a vision of "vanity," Ecclesiastes—may have *sanctity of joy and simplicity* as its primary theme. The Festival of Light (*Chanukah*), already transfigured from a victory of the sword, in commemoration of the Maccabees, to a victory of the spirit, might become a *festival of Jewish youth and hope.* Feast of Lots (*Purim*), in which story perhaps fancy has outlived fact and in which "Mordecai" and "Esther" are perhaps word-descendants and sublimated versions of "Marduk" and "Ishtar," might be a synthesis of the spirit of frolic for its own sake and high seriousness derived from Jewish survival and its relation to the social phenomenon of "dislike for the unlike." Passover (*Pasech*) may expand its saga about ancient freedom in a pastoral-agrarian setting—itself an enshrinement of a simple spring festival—from a commemoration of freedom in a simple semi-agricultural pattern of life, to a challenge of "freedom" in a complex industrial pattern of life. Pentecost (*Shevuoth*), a holiday devoted to the Torah—which in Hebrew means "teaching" as well as "Law"—might have as added value, *Love of Learning and Love of Nature.*

What is suggested above as possibilities for supplementary values in the present festivals of the Jewish calendar might similarly be attempted with major holidays of other religious calendars. Many of the Jewish and Christian festivals, no doubt, stem from common sources, or are outgrowths one from the other. Thus, Easter, derived in part from Passover, is a holiday of resurrection at the spring solstice when the earth itself is in literal resurrection. Christmas, similarly, occurs even as Chanukah does, about the time of the winter solstice. "Days" in Christian, Mohammedan and other religions, even as the festivals of Judaism, might be reinterpreted—*without loss of their present status, but with added social content*—and better so, if they can be done within a system of calendation as is now presented by The World Calendar Association which offers a minimum of misunderstanding with a maximum of universality.

Not only old religious festivals could have new meanings; secular holi-

days also, in America especially, can stand social advance and more effectively so under the auspices of an American unit in The World Calendar Association. Thus a number of American holidays, especially the two in February, by virtue of the significance of men like Washington and Lincoln, whose births they commemorate, can serve as "birthdays" for social attitudes supplementary to and largely derived from the character and contribution of these Americans.

Over a hundred incipient but nevertheless incendiary Fascist groups are now trying to "purge" such great days from their original social content in behalf of their "slant" on political unity. They forget that cultural plurality as well as political unity form the dual significance not only of these "days" but of creative America. And how can even political unity be creative—and not coercive—without cultural plurality? Indeed a challenge for a Social Calendar!

During recent years, fortunately, a great group of liberals found they could honor Washington in the finest American way by adding his great ideal of tolerance to the celebration of his birthday, and by making the occasion a day of national significance as Brotherhood Day, in which churches of a continent and faiths of a free land participated, a "day" devoted to "make America safe for differences."

As Washington's Birthday now has the added value of interfaith-fellowship, so easily related to the spirit and derived from the writings of Washington, so, too, Lincoln's Birthday may serve equally for a message inter-racial in scope and spirit, so that this day, too, may be enhanced with social aims—and thus added personal tribute to—the "Great Emancipator."

Other "days" in the American year suitable for consideration in an attempt at a Social Calendar are as follows:

FEBRUARY: *Consumer's League Sunday*, initiated by the National Consumer's League in 1924; *Anti-Narcotic Day*, originated by civic leaders in 1927.

APRIL: *Health Week*, first proclaimed in 1924; *Prison Sunday*, suggested by National Commission on Prisons and Prison Labor; *Play Week*, inaugurated by Playground and Recreation Association; *Housing Sunday*, started by National Housing Association; *Youth Week*, initiated by National Youth Commission.

MAY: *Youth Day; Child Health Day*, first proclaimed by Governor of Ohio, 1924; *National Music Week; Mother's Day; Peace Heroes' Day*, inaugurated in 1924 by Peace Heroes' Memorial Society.

JUNE: *Tree-Conservation Day*, started by National Farm School; *Children's Week; No-More-War Day*, initiated by National Council for the Prevention of War.

JULY: *Independence Day and Inter-dependence Day.*

SEPTEMBER: *Labor Day; American Indian Day.*

OCTOBER: *Fire Prevention Day; Boys' Week.*

NOVEMBER: *Armistice Day*, as a dramatization in behalf of peace rather than war; *Father and Son Week; Education Week; Thanksgiving.*

DECEMBER: *Anti-Tuberculosis Sunday*, initiated by National Anti-Tuberculosis Association.

These by no means exhaust present American possibilities for a Social Calendar that could well accompany a "Revised Calendar."

CANADA URGES UNITED ACTION

By PHILIP MACAROW

in the Toronto News Weekly, *Saturday Night*

THERE is a movement on foot to reform the calendar. It is a movement in which Canada, in common with other civilized countries, will be expected to participate. The proposed reforms are neither vague nor remote; they are specific and imminent. Indeed, it now appears that 1938 may be the last of our old familiar years; that January 1, 1939, may usher in a really new new year. Hence, anyone who has anything to say about it had better say it now.

Any discussion of the proposed reforms demands some knowledge of what is wrong with our present calendar. It must be admitted that quite a lot is wrong with it. It is—say those who wish to change it—clumsy, inconvenient and lopsided, besides being ridiculous. An ordinary year (that is, a year which is not a leap year) contains 365 days which our calendar endeavors to divide into twelve months and fifty-two weeks. It does so, in a manner of speaking, but the months are far from uniform and, instead of fifty-two weeks, we come out with fifty-two and one-seventh. We are in the habit of regarding six months as half a year, but actually the first half of the year—January to June inclusive—is three days shorter than the second half, and our quarters are not really quarters at all.

The fundamental source of the trouble, of course, is our attempt to establish a relationship between two unrelated time units, the day and the year, both of which are of basic importance in human affairs and over neither of which have we any control whatever. We must count time by days but, since we have summer and winter, spring and autumn, we must also reckon with the year. Now a day is the space of time it takes the earth to revolve once on its axis and a year is the space of time it takes that same earth to complete one circle in its orbit round the sun. Unfortunately, there is no relationship between these two movements of the earth which can be expressed in simple arithmetic, so that only once in every 43,200 years does the solar year begin within one second of midnight.

Advocates of calendar reform admit the difficulties but condemn the way we meet them. Our present calendar, they say, is a primitive affair (it dates back to the times of Julius Caesar), badly in need of overhauling. They attack it not only from a scientific and rational angle but from a practical point of view as well. Its irregular structure makes a comparison of statistics for one quarter with those for another difficult and misleading. Every year differs from every other year, with the result that it is absolutely impossible to tell on what day of the week a given date will fall—or

vice-versa—without recourse to calendars or long and laborious reckoning.

The allocation of thirty, thirty-one and twenty-eight (or twenty-nine) days to the various months is another matter of much practical confusion. Most people cannot even remember which months have thirty days and which have thirty-one except by the old jingle:

> Thirty days hath September,
> April, June and November,
> All the rest have thirty-one,
> Except the little one alone,
> Which has twenty-eight in fine,
> Till Leap Year brings it twenty-nine.

Why this should be so, why we should have seven months of thirty-one days, four of thirty and one of twenty-eight (or twenty-nine) is a matter for which no one can now give a satisfactory explanation. It has its origin in certain remote considerations of possible importance in the time of Augustus and has perpetuated itself in spite of its inconveniences. That we have become accustomed to these inconveniences does not alter the fact that they exist and make themselves felt in loss of time, loss of energy and confusion of many kinds.

All this inconvenience and confusion would disappear at once if we could rearrange the calendar so that the days of the week and the days of the year would fall always in one prearranged order. To do this it is only necessary to construct a calendar which will be the same every year and so simple it can be memorized by anyone. Obviously, such a calendar must contain exactly fifty-two weeks. This is the most important aim of every plan of calendar reform.

How can it be done? So far no fewer than 185 methods have been suggested. Of course, many of them contain only slight variations and many more are too fanciful or too drastic for serious consideration. The workable, practical suggestions boil down to two: a year of thirteen months and The World Calendar plan.

Under the thirteen month plan, a new month with the tentative name of "Sol" would be added to the calendar. Every month would be exactly like every other month, containing precisely twenty-eight days or four weeks. At the end of the year, an extra, nameless, dateless day would be added to round out the necessary 365. In leap years, two such days would be added. The world would then have a simple, perpetual calendar under which most of our present difficulties would disappear. Unhappily, however, a new set of difficulties would be introduced.

First, the number thirteen is not divisible into halves, quarters or sixths. It is not, in fact divisible into anything at all without the use of fractions. Second, all monthly accounting of annual items, such as rent and interest, would have to be figured in terms of a thirteenth of a year.

The number thirteen, which is difficult to figure with, would occur billions of times a year in every-day reckoning. Third, all routine activities which occur in the course of a month such as paying bills, getting out statements, attending meetings and collecting statistics, would have to be repeated an extra time each year. These objections are so formidable and weighty that the thirteen month year has already encountered a tremendous amount of opposition.

There remains The World Calendar plan. This plan retains the present twelve month year and so escapes most of the disadvantages of the thirteen month plan. But it rearranges the months into a more orderly and balanced structure, containing two equal halves and four equal quarters. Each quarter consists of three months; the first month has thirty-one days, the remaining two have thirty. These quarters also comprise exactly thirteen weeks each, or ninety-one days, of which thirteen are Sundays and seventy-eight week-days. It is not quite as simple as the thirteen month calendar in that its months are not all the same length. But its quarters are. Every three month period is exactly like every other three month period, and the calendar as a whole is perpetual in form and reasonably easy to memorize.

Like the thirteen month plan, it provides an extra day to round out the year. It places this day at the end of December and calls it "Year Day." In leap years, a similar day is added at the end of June. Since, under The World Calendar, January the first always falls on Sunday and since, under our present calendar, January 1, 1939, will fall on Sunday, a determined effort is being made to put the plan into effect in 1939, so that the old calendar may merge into the new with a minimum of disturbance and confusion.

To secure such a result, simultaneous and nearly universal action must be taken by the parliaments and legislatures of the world. It is possible that it will be taken, for calendar reform is now receiving organized support all over the world. Fourteen countries, including Canada, possess associations dedicated to that purpose and most of them support The World Calendar plan at least in principle. In 1931, at Geneva, a conference of delegates representing 44 nations expressed their views on calendar reform. All agreed that it was bound to come. Rejection of the thirteen month plan and interest in the twelve month plan were expressed by Great Britain, Germany, Italy, Japan, Belgium, Greece, Irish Free State, Netherlands, Sweden and Switzerland. Two of these, Switzerland and Greece, gave definite commitments on behalf of their governments for the twelve month, equal quarter calendar.

Canada's position at that conference was perhaps a little unfortunate. The Canadian delegate, acting under instructions from Ottawa, cast a definite vote for the thirteen month plan and had the doubtful comfort of being supported by the delegate from Jugo-Slavia and no one else! Thus, Canada's official position at the moment favors the thirteen month plan.

Since then, however, the Canadian Rational Calendar Association, with headquarters in Toronto, has been formed. The stated purposes of this association are: (1) To secure withdrawal of Canada's official endorsement of a thirteen month calendar. (2) To advocate world-wide adoption of a national perpetual twelve month equal quarter calendar. (3) To inform public opinion on the defects of the calendar now in use. (4) To promote the adoption of a stabilized Easter along the lines of the British Parliamentary Easter Act of 1928.

Ingenious and rational as the proposed World Calendar appears to be, no one can foresee all the consequences of a change in the calendar. In the past, whenever such changes have been made, they were accompanied by riots and bloodshed resulting largely from the deeply rooted belief that the calendar is a divinely appointed institution which must not be tampered with. Even today, enlightened though we are, there will undoubtedly be objections to calendar reform on religious grounds.

Without subscribing to such objections, no one can question the right of the objectors to make their objections known. Indeed, the practical point of this whole discussion is that anyone who does object to calendar reform—whether on religious, rational, scientific or practical grounds—will do well to make his or her objections known with all possible speed. Similarly, those who favor reform, either along the lines of The World Calendar plan, the thirteen month plan or any other plan, ought to give expression to their views in a manner that will reach the sometimes none too keen ears of our law-makers. Only in this way can the Canadian government be expected to act in accordance with the wishes of the Canadian people when next that government is called upon to state its position with regard to calendar reform, and possibly to back up its position with legislation which will call a new calender into being in this Dominion.

ACTION BY INTERNATIONAL LABOR OFFICE

CALENDAR REFORM appears on the agenda of the April session of the Governing Body of the International Labor Office at Geneva, as a result of the strong resolutions passed by the South American governments at the Santiago Labor Conference of January 1936. The text of the Santiago resolutions is printed in full on the inside back cover of this issue of the *Journal of Calendar Reform*. The International Labor Office has been an advocate of calendar revision since 1928, and has fully supported the League of Nations program on this subject.

CHANGE OF ADDRESS

OFFICES of The World Calendar Association are being moved from 485 Madison Ave., New York City, to Room 903, International Building, 630 Fifth Avenue, New York City.

WORLD LOOKS AT TIME MEASURE

By CLYDE A. MANN

Managing Director, Certified Building Registry of the U. S.

In the "Science of Progress" Magazine, March, 1936.

IT need not cause surprise to learn as the writer has, recently, that the measure of time, the Gregorian Calendar used daily throughout the civilized world, has proved so faulty in various ways that it seems likely to be replaced by another called The World Calendar. Neither need one be surprised to learn that the processes by which that change will be brought to pass have been necessarily world-wide and tedious of completion. It will be important in every walk of life, for "in conscious evolution time is of vital importance."

The task which confronted and still confronts those who have devoted years of time and large sums of money to the needed reform of the accepted calendar was made complex by the fact that today there is no international authority to decree this change, as there was when in 1582 Pope Gregory decreed the calendar used today and therefore called the "Gregorian." Then ecclesiastical authority was all but supreme; at least it was centralized. Times have changed since then. Now the change can come about only through a common consent based upon understanding of the many reasons for a change.

Those reasons are primarily monetary, prompted by handicaps to business caused by the use of the present yardstick. Representation of governments, railroads, commerce of all kinds, construction undertakings, the chamber of commerce, of state-wide, national and international scopes, have been responsive. Also educationalists, especially those concerned with public schools, have urged reasons of their own. The ecclesiastical sentiment with regard to Easter—the date of which fluctuates with the years even 35 days—has added other reasons, all impelling change.

It is obvious that to the accounting of governments, of bankers, of manufacturers, of builders, of shippers, of insurance companies, the inequality of the number of days in each "quarter" of the year as well as inequality in length of months causes confusion which creates uncertainties and inaccuracies. The Gregorian Calendar had little consideration for regularity or perpetuity of dates, for the old jingle tells us that Thirty days has September, April, June and November; all the rest have thirty-one excepting February alone, which has but twenty-eight in fine till Leap Year gives it twenty-nine. The years do not start on the same day of the week and neither do holidays fall upon the same day of the week year after year. Easter varies widely in date. The quarters are 90, 91, 92

and 92 days, a variation which throws comparisons out by two per cent.

There are no duplicates of years except at intervals of as much as six years, and even eleven years, so it cannot be memorized; new printed calendars are needed each year. The anniversary of any event will recur on the same day of the week but eleven times in any century. The number of work days in the months varies from twenty-four to twenty-seven (without considering holidays) and this proves a serious handicap to the computing of labor costs of any construction work or undertakings of other sorts. This variation of work days in a month amounts to as much as 12½ per cent, quite too much to be further ignored. Our bothersome Gregorian Calendar causes anniversaries and fixed dates to fall sometimes on Sundays, making their observance difficult or impossible.

The world has been awaking to the need for some change in the yardstick used for time measurement during most of the years since the decree of 1582, but it has only been in recent years that anything effectual has been done about it. Two plans have been offered; one of them, with the chief merit that months will be of uniform length, proposes a 13-month year, each month of 28 days, a total of 364 days and with another day added, called "Year Day," to make the 365. A day in Leap Year is to be added after June 28th. The new month proposed has been called "Sol." This, of course, is such a radical upset of custom, besides involving calculations by the divisor 13, that it may not be considered as a serious proposal. Not so The World Calendar, for which there have been endorsements from the British Parliamentary committee and those of Switzerland, Germany, Italy, from official spokesmen for Turkey, France, Japan and other countries. The International Chamber of Commerce, in an official report, remarked, "There is no longer any reason for the anomalies of the Gregorian Calendar and it is surprising that they have been kept."

The United States Chamber of Commerce has taken action urging that the United States Government participate in an international conference called to formulate a plan for calendar reform and it will be through such procedure that the change can be brought about. Ecclesiastical authority no longer is great enough to bring the change to pass. Instead, the official statement from a special committee of the League of Nations has cleared the way officially for general adoption, about 1939, of The World Calendar. That official statement by the League committee included this indictment of the Gregorian Calendar for the vast business of the countries of the world in this year of 1936:

"All calculations of salaries, interest, insurance, pensions, leases and rent which are fixed on a monthly, quarterly, or half yearly basis are inaccurate and do not correspond with one-twelfth, one-quarter, or one-half of the year . . . banks are obliged to make constant use of special tables . . . the calendar is not perpetual; it changes each year. . . . Dates

of periodic events can never be fixed with precision. . . . The position of the weeks in the quarters varies each year . . . and complications accordingly arise in the reckoning of accounts, statistics, etc."

The world-wide discussion which has been raised about the need for a calendar improvement has had the effect of promising the discarding of many calendars other than the Gregorian when The World Calendar comes into use. In India alone there are several in use; but there also are the Julian, the Armenian, the Coptic, the Syrian and the Mohammedan. Church leaders are outspoken in saying that adoption of one calendar for the world has religious significance and it will have effects in dissolving the boundaries between men and races to meet the need created by miracles in transport, communications and commerce of recent years.

The prospect of change makes The World Calendar plan of general interest, a step toward better balance. In this plan New Year's Day falls perpetually upon Sunday; a "year end day" has been provided following December 30th, as an extra day; the Leap Year Day follows June 30th.

The solar year will continue to govern the affairs of mankind through this calendar when adopted, a period of a little more than 365 days. Reduced to weeks, the ordinary year has 52 1/7 weeks, but every fourth year 52 2/7. This explains why a given year's Gregorian calendar has been repeated only eleven times in a century, and why each year is different. The week has not been one of seven days since the days of Constantine only, but way back in Chaldean and Egyptian times the custom of that division of time began. The Jews, of course, made much of it, with one day of seven for rest. That custom, still followed by Christians in Rome of keeping one day for rest and meditation, according to Biblical injunction, appealed to Constantine; he found men and women were happier, lived longer and could do more work.

The patient effort of procuring from all parts of the world and many walks of life—ecclesiastical, astronomical, governmental, transport, education and others—the response to inquiries whether it was not thought time to correct an inaccurate measure of time; then with evidence in hand of the need, offering for consideration (in many languages) the new calendar plan proposed, has gone quietly forward with notable success. It has been carried on by The World Calendar Association, at the head of which is an indefatigable woman, Miss Elisabeth Achelis. Her zeal is not for reward, but, like many activities of progress today, for world advancement in the zone which interested her, as the telephone arrested the energies of Bell, the wireless those of Marconi, and so on across the page of progress. Mind, infinite, has worked through many patterns and found expression. The increasing need for common consent has been very clearly defined and there is reason to expect acceptance in about three more years.

FOLLOW THE KING!

By ERLAND ECHLIN

Secretary of the Rational Calendar Association of Canada

WILL Great Britain, which has already advanced farther along the path of legislative calendar reform than any other Great Power, signalize the new era which is marked by the accession of its new King by taking up the world leadership in this movement for revision of the international system of time measurement?

The night the King of England died I was at Dorchester House, that swank modern hostelry in London's Park Lane, reviewing a full dress rehearsal of the performance planned for the following evening. In the middle of a musical number the managing director entered, crossed quietly to the front of the low stage, held up his hand: "We have received very bad tidings of His Majesty. His life is coming peacefully to its close . . . everyone please go home. There will be no more rehearsals, no opening . . . we will let you know when you are needed." Though it meant complete revision of the social schedule and an actual monetary loss of thousands a day, there was no impatience; only compassion for the royal family. Later I was told, "Yes, it is unfortunate, perhaps, but with the new King will come a new era."

Signs of the new era began at once. Within five days Edward VIII had smashed half a dozen precedents and at least one tradition. Court mourning was cut by three months, public mourning to seven days. The monarch had appeared hatless in public and before thousands of people he had run down the steps of Westminster Hall—because he was in a hurry. In his first address to Parliament Edward VIII was unbelievably brief and used "I" instead of the traditional "We" of royalty.

After weeks of rain, fog and dull weather, the first day of Edward's rule was clear and sunny—"King's weather." But the sun had scarcely risen that first morning before the new King had performed an act that may be construed as heartening to all those interested in the measurement of time. For thirty years the clocks at Sandringham had run half an hour fast—for the grandfather of the present King liked to keep people on time; and later appreciated the extra daylight. Edward VIII's first kingly action was to have the clocks throughout the 90-room cottage adjusted to correct time.

The act is significant. England follows Germany, Italy, Austria, Russia and many nations of the Balkans and Near East with a comparatively young man as leader. Almost alone, France has still to make her selection. These leaders are keen, modern-thinking post-war prod-

ucts anxious to simplify both business and the business of life. It can scarcely be doubted that their weight will be on the side of progressive people everywhere who are striving for swift reform of the calendar. Or that, under their influence, the next few years ahead will show the peak of progress.

Viewed comparatively, this progress has been astounding. It took 15 centuries to change a calendar that was actually incorrect in its operation and another 150 years before the obviously correct and necessary alterations of Pope Gregory XIII were adopted by Protestant Europe. Yet I venture to say there has been more progress in reform of the calendar in the past five years than in the previous two thousand.

There have always been calendar reformers. Their ingenious schemes over the centuries number thousands. Most have been local, prompted by the needs of groups or personal inventiveness; a few with wider inspiration have received wider acclaim. None has made the universal appeal of The World Calendar with its equal quarters and balanced years, its symmetry and balance, its harmonious arrangement and its convenient perpetuity of form.

Best advertised—especially during the early part of this present century—has been the 13-month scheme. In one sense it has retarded real reform; in another, assisted it. Many persons, with the understanding minds of true "world citizens," dropped consideration of calendar reform the moment they heard "13 months." No superstition hung over them, indeed they brought forward but one statement to account for their lack of interest. In effect, they said: "Of all numbers, why select the most awkward as a base for our time calculation?"

On the other hand, it has undeniably attracted attention to the defects of the calendar we use. It has again illustrated the old call of like to like. Compiled out of the past by a Yorkshireman temporarily domiciled in Canada, Mr. Moses B. Cotsworth, it was planned with both eyes full on the needs of certain highly organized industries. From one of these, with plants scattered over the globe, it received most of its support. After a brief run as a novelty before the public, it has again reverted to what it was intended to be—a highly specialized accountancy calendar.

The World Calendar is founded squarely on humanity's will to progress. No race, creed, sect or group is specially served—it is for the whole. The World Calendar respects custom, tradition and the beliefs of the people. Because of its simplicity and the disinterested sincerity with which it has been propagated, it is fated for early success. When, a short time from now, year follows year under the harmony and balance of The World Calendar, mankind will realize that another important forward step has been taken in the history of life.

It may do more. By some magic spiritual alchemy the improved bal-

ancing of time may help quench hatred, war-fires, uncertainties that try the souls of men.

These are not wholly my own views. For the second time in the past eight months I have just completed a round trip of continental Europe—from the old northwest provinces of Russia down to Rome. Of the Old World's thirty chief countries, twenty-five are represented by membership in The World Calendar Association. Eleven nations have active committees working for the adoption of The World Calendar. I talked with members and committees in every country I visited, and from these conversations formed the views expressed here.

The World Calendar is forging ahead. The Protestant Church and the Eastern Orthodox Church now no longer merely favor "calendar reform"—they are lined up behind The World Calendar. Many highly placed Roman Catholics, laity and clergy, support the reform. From my conversations in Rome I have no hesitation in saying that when the Holy Father is convinced that it has the approval of his world family, the question will receive his earnest consideration. And when it reaches that stage, reform is at hand. He is already known to heartily disapprove the 13-month scheme.

No one is more aware of the growing universal support of The World Calendar than the nations in council at Geneva. The subject comes up for discussion again this year, and it is certain that as a result the actual planning stage will be appreciably nearer. The newest reports at the League indicate that strong national support from both the Americas will be forthcoming. And the largest nation of Western Europe—Germany—is organizing a new World Calendar committee which will function under the eye of the Department of the Interior itself.

Great Britain is in a class alone. Most nations link the fixation of Easter with calendar reform—but only in England has any parliament actually passed laws to provide for this. Here England leads, for such an Act stabilizing Easter has been on her statute books since 1928. And I would like to suggest that, under the new King, new life is given to every forward-looking movement. Viscount Castlerosse said this week: "He is a modernist. . . . King Edward VIII lives very much in the future. . . . His reign will, I fancy, become famous as a go-ahead period."

As the President of the United States attracts the attention of the New World, so the King of England influences the older nations of Europe. Despite vast differences of race, creed and color, he is the one man everywhere acclaimed as worthy of attention. His first act with the clocks at Sandringham showed a time consciousness encouraging to calendar reformers. Who, in the interests of simplicity and accuracy, will follow the King?

DIALOGUE BY RADIO

In a course of science talks by radio, supplied by the famous Franklin Institute of Philadelphia to the audience of Station WCAU—better known as the Boake Carter station—Professor James Stokley of the Institute occupied a 15-minute period with a discussion of calendar reform, given in the form of a dialogue with Major Thomas Coulson as master of ceremonies. The dialogue, as broadcast on January 11, is reprinted here in response to many inquiries for a model radio talk on this subject.

COULSON: And here's Mr. Stokley. I think that he's going to tell us something about the calendar—— Is that right, Mr. Stokley?

STOKLEY: Yes, Major Coulson. You know ordinarily we take the calendar for granted. In just the same way we never pay much attention to the parts of our body, until we have an ache or a pain. But this is the year when we have one of the aches that calls our attention to the calendar.

C.: What do you mean?

S.: Simply that this is leap year. Next month we add the extra day that has to be inserted regularly to keep the months in step with the seasons.

C.: Why isn't it possible to have a calendar that doesn't need to have a leap year?

S.: Because it has to measure two different units that cannot possibly be fitted together exactly. In that respect the measurement of time differs fundamentally from our measures of length, weight, area and so on. These units are selected so that there is always an even number of the smaller ones in the larger—that is, there are just twelve inches in a foot, not twelve and 496 thousandths. There are exactly sixteen ounces in a pound, not sixteen and four-fifths.

C.: But there are also 60 minutes in an hour and 24 hours in a day!

S.: Yes, but there are the derived units. The day and the year are the ones that we start with, and they are both determined for us naturally. The day is the length of time that the earth requires to make a complete turn on its axis; and the year is, of course, the period during which the earth travels in a complete circuit of the sun. Roughly, we often say that there are 365 days in a year. After the earth has turned 365 times on its axis it has almost made a complete trip around the sun, but not quite. It has to make about another quarter of a turn before the trip is completed, so that it is more accurate to say that there are 365¼ days in a year. If you want to be still more precise, you can say that the number is 365 and 10926/86400 days. But even this is not perfectly exact. As a matter of fact, no matter how many figures you use in your fraction, you still cannot express the exact number of days in a year. As the mathe-

matician says, in his technical way, the two figures are incommensurable.

C.: Yes, that does make it rather complicated!

S.: But that's not all. There is also a third natural unit, the month, which was originally the time that the moon takes to go through a complete cycle of changing phases, a little more than 29½ days. And that does not fit into either the day or the year.

C.: The Mohammedans use the lunar month in their calendar, do they not?

S.: Yes, they use it and so do the Jews. The ordinary Jewish year has twelve months, of 29 and 30 days alternately, making the average length 29½ days, which is almost correct. But this only comes to 354 days, or eleven days short of the year length, so, if this went on, the calendar would drop a month behind the seasons every three years, and the same date would sometimes come in summer and sometimes in winter. To prevent this, an extra month is inserted about every three years, and this keeps the calendar from getting more than a month out of step with the seasons.

C.: Does the Mohammedan calendar work the same way?

S.: Not quite. Before the time of Mohammed the Arabs used practically the same system, but the prophet told them that twelve was the number of months according to the ordinance of God, and that thirteen months was contrary to the divine appointment. So ever since his time their calendar has been based solely on the moon, and they let it get out of step with the seasons. After all, there isn't as much change in the seasons in most Mohammedan countries as there is in temperate regions, and it was very easy for the early peoples to observe the changing phases of the moon.

C.: Our own calendar came from the Romans, didn't it? What was theirs originally?

S.: A combination of the sun and the moon. They had twelve months of 29, 30 and 31 days in length, making a year of 355 days, which, of course, regularly got out of step with the seasons. So they added a month occasionally to bring it in step again. But the business of putting in the extra month was left to the magistrates, and this was a nice source of graft. If they wanted to stay in office a little longer, they could just add an extra month. Thus, when Julius Caesar came into power, he found the calendar in what may very properly be described as a mess!

C.: And Caesar fixed things up?

S.: Yes. First of all he called in expert advice, in the person of an astronomer named Sosigenes. Then he threw the lunar month overboard completely. He took the length of the year as just 365¼ days, which was the best value available at that time. He decreed that thereafter the ordinary year should be of 365 days in length, divided among twelve months.

Thus, in four years, the calendar would be a full day behind, so then would come a year of 366 days to bring them into step once more. This was the beginning of the leap year.

Caesar began his calendar in the year 46 B.C. Because of the way the earlier calendar had been tortured, the beginning of spring was coming in May, so he lengthened this year to 445 days. The next year the beginning of spring came on the 23rd of March, and the year began at this time. Such was the origin of the Julian calendar.

C.: How long did it continue in use?

S.: Until the present day, to some extent. The Greek Orthodox Church still uses it. Maybe you noticed in the papers that they celebrated Christmas last week.

C.: But most countries changed from it many years ago, didn't they?

S.: Yes. The trouble with the Julian calendar is that the year isn't exactly 365¼ days in length, but 365 days, 5 hours, 48 minutes and 46 seconds, or a difference of 11 minutes, 44 seconds by which the Julian year is too long. This amounts to just a little more than three days in four hundred years. By the year 1582, the dates had dropped back about twelve days, and the beginning of spring was on March 11. This meant that Easter was gradually coming earlier, and, if things went on, would have come in the middle of winter. So the Catholic church took a hand. Pope Gregory XIII, following Caesar's excellent precedent, called in an astronomer for advice. His name was Christopher Clavius, and as a result of his suggestions, the Gregorian calendar was decreed by Papal bull in 1582. . . . To bring the calendar back to the time, not of Caesar but of the Council of Nice, held in 325, when the rule for the date of Easter had been adopted, ten days were dropped completely. The day after October 4, 1582, was not the fifth, but the fifteenth. And then, to keep the correspondence as close as possible, it was arranged that three leap years should be eliminated every four centuries. The rule adopted was that every year which could be evenly divided by four would be a leap year, unless it was the beginning of a century. In that case, it would have to be divisible by 400. Thus, 1600 was a leap year and 2000 will be one also, but 1700, 1800 and 1900 were not.

C.: How accurate is the Gregorian calendar? That is, how long will it be before the slight remaining error will become noticeable?

S.: After 3000 years, the calendar will be a day early.

C.: I suppose that we do not have to worry about that for a long time to come, then! But what are the calendar reforms that are now being discussed?

S.: Solely in the arrangement of the days and months within the year. Such a reform wouldn't be nearly the drastic thing that happened in 46 B. C. and 1582, except that our modern life is so much more complicated and

more sensitive to change. Anyhow, we wouldn't have to drop any days from our lives, and that was one of the chief complaints when the Gregorian calendar was adopted in England. Do you recall what year that was?

C.: I believe it was in 1752.

S.: Yes, I think it was. But you know that there were riots, and at Bristol several people were killed. By that time the difference was eleven days, and the people cried, "Give us back our fortnight," even though the act of Parliament had been carefully drawn to prevent any injustice in the matter of interest, rents, wages or other payments due.

C.: Why do the modern reformers want to change the arrangement of the months?

S.: So that the same day of every year will come on the same day of the week, and so that the year can be divided more evenly than at present. Now, for example, the second half of an ordinary year contains 184 days, three more than the first half. The quarters vary in length from 90 to 92 days, and the months from 28 to 31 days. In bookkeeping, and statistical work, for instance, these periods are hardly comparable, because of their different length, and, if you are paid by the month, you do a lot less work for your salary in February than you do in January.

C.: How can this be avoided?

S.: There are two principal schemes that have been suggested. One group would like to have every month the same length, and have every day of every month come on the same day of the week. Thus, each month would have to be four weeks, or 28 days, in length. But twelve times 28 is only 336, so they propose to put in another month, which brings the year to 364 days. There is still an extra day left over, so the idea is to make this a very strange kind of a day—one that does not belong to any week. It would be inserted at the beginning of the year, as Year Day, and might well be a holiday, corresponding to our New Year's Day of the present.

C.: It seems to me that a year of thirteen months would be rather awkward!

S.: Yes, it undoubtedly would be. And superstitious people wouldn't like it, because the thirteenth of every month would be a Friday!

C.: What is the other proposal?

S.: The one known as The World Calendar. Its advocates are willing to have the months of different lengths, only by a day, but want to have the quarters contain the same number of days and an exact number of months, which is not possible with thirteen months. They would use twelve months, as now. The first month of each quarter, January, April, July and October, would have 31 days, and all the others 30. Each quarter would begin on a Sunday and end on a Saturday, and the same date would come on the same day of the week each year. January 9, for instance, would always be a Monday, June 12 a Tuesday, July 4 a Wednesday and Christmas a Monday. . . . Even in The World Calendar, however, there are only 364 days in the year that are regularly assigned to weeks, and so it also requires the use of a Year Day, and of a Leap Day, every fourth or eighth year, in accordance with the Gregorian rule.

C.: Do you think that such a calendar will soon be adopted?

S.: Perhaps. Certainly The World Calendar has many advantages over our present system, and also over the thirteen-month scheme. The proponents of the scheme have made great headway in the last few years, however, and they would like to introduce it in 1939.

C.: Why?

S.: Because that year begins on a Sunday, like The World Calendar, and the change could be made with very little confusion. Not until 1950 will a year begin on Sunday again.

FIXING CAESAR'S 12-MONTHS

By J. B. PERRY ROBINSON

Secretary of the Rational Calendar Association, London

Prizes for 1000-word broadcasting talks, to be used over the networks of the British Broadcasting Company, have recently been offered by the British monthly magazine *Mine*, published by Pearson's. As an introduction to the prize contest, the magazine publishes the following informative general article, written by the well-known publicist who will judge the submitted manuscripts.

REFORMING the calendar—that rather surprising ambition which possesses a large number of people to-day—was a favorite pastime of ancient dictators. Indeed, one of the first acts of Sargon invading Mesopotamia or Genghis Khan pouncing on India was to decree a new calendar for the conquered land. For in those days every conqueror brought his own religion, and every religion was based on agriculture, which needs elaborate calendars. In any case, nothing proved the success of a new conquest better than the establishment of a new calendar regulating the lives of everybody in the land.

There is no more convincing proof of the effectiveness of Julius Caesar as a dictator than the fact that practically all the world still uses what is really his calendar. Even the reason why February has only 28-29 days is that Caesar's successor, Augustus, having decided to name the eighth month after himself (as Julius had the seventh, July), could not allow his month to have only 30 days while Caesar's had 31, and so stole a day from February, then the twelfth month, and added it to "August."

An old story says that during his campaigns in Gaul Caesar "found himself going into winter quarters as the spring was coming on." There is probably a lot of truth in this jest, for at that time the old calendar of Rome was a very muddled affair, entirely in the hands of the priests, who were not very good astronomers and had let the year as they measured it get far out of step with the sun's year. If Rome had merely remained a small Latin state in the middle of Italy, this would not have mattered much, but she was beginning to spread an empire over the whole Mediterranean, and her merchants were finding that trade on an imperial scale demanded a more coherent and business-like system of dates.

So when he became dictator Caesar established a fixed calendar with the twelve months which we now use, and a fairly accurate leap-year system. (Leap years are necessary because the sun takes about a quarter of a day more than 365 to "go round" the earth, so that in every four years it gains a day on us, which we have to catch up by putting in an extra day.) How necessary Caesar's reforms were is shown by the fact

that the first year (46 B.C.) of his new calendar had to have 445 days before the years could start straight again. In Roman history it was known as the Year of Confusion.

Some say that the Roman Empire has never ceased spreading; certainly its calendar penetrates farther every year into the few remaining un-Westernized lands. Yet it is not really a very good calendar. Modern scientific industry and trade find that it has many inconveniences, such as quarters of unequal length (the first generally has 90 days, the second 91, and the last two 92), and months that sometimes have only 22½ and sometimes 25 working days.

Such irregularities make it impossible to compile those exact statistics of production and turnover and profit on which, in these highly competitive days, the success of any business so largely depends.

It is as if the British Broadcasting Company tried to broadcast piano music on a piano that had different numbers of notes in each octave; or as if successive petrol pumps on the same stretch of road gave different quantities of spirit in their gallons, some giving 7 pints and some 9, some highly refined spirit and some quite crude.

There is also the very disturbing factor of a widely varying Easter, which throws the chief public holiday of the year backwards and forwards from one month, and even one quarter, to another. If it is very early—it can be as early as March 22—the weather is apt to be cold; people will not buy tennis shirts or ices or want char-à-banc trips or open-air sports on their holiday. The next year it may be very late—as late as April 25—and they will want all these things, and not want pullovers or heavy shoes or hot meals; and the trades (catering, outfitting, transport and entertainment) that the year before had to prepare for a wintry holiday have now to readjust all their stocks and advertising to meet a summer festival.

This disturbing arrangement we owe partly to a Council of the Church in A.D. 325, but principally to the next great calendar reformer after Caesar, Pope Gregory XIII, at the end of the sixteenth century. It is actually after him, and not after Caesar, that our calendar—the Gregorian System—is officially named. But so far as the calendar as a whole is concerned, all he did was to tidy up an inaccuracy in Caesar's leap-year method. Caesar had decreed a leap-year *every* four years, which is a little too often, and in the course of 1,500 years the sun had got ten days ahead of the calendar. So Pope Gregory cut the days between October 4 and 15 right out of the year 1582, and reduced the frequency of leap-years thereafter.

Pope Gregory's reforms were at once accepted in all lands where the Roman Church held sway. England adopted the reforms in 1752.

That was the last occasion when anybody did anything to Julius Caesar's calendar so far as this country is concerned. Since the war, however, here, as in most other countries, business men and merchants

have been asking for a new and radical reform of it. They and professional men, such as lawyers, schoolmasters and all whose lives are measured in terms, want a calendar which will be the same from year to year; a calendar in which Easter always comes at the same week-end, and Christmas is always, say, a Monday. With such a calendar there would never be any need to consult an almanac to discover when, say, the third Thursday in October was (it would always be the 19th) or what day of the week one's birthday will be (it would always be the same). One would have learnt the whole calendar in one's cradle, in the same way as one now learns the multiplication table and how to tell the time. A permanent almanac could be engraved on cigarette cases, watches, public clocks, etc.

It is quite simple to achieve such a perpetual calendar. All that is necessary is to make one day in the year a special day to be called by a special name; in other words, have fifty-two ordinary weeks and then when we come to the 365th day, simply call it New Year's Eve or some such name and not include it among the days of any week. Then the next year and all subsequent years will begin on Sunday.

To stop the variation in the date of Easter an Act of Parliament has already been passed (in 1928), but it has never been brought into force. This Act could become law at any moment, but it is more likely now to be incorporated in a general reform of the calendar.

Once a perpetual year is assured by the exception of this non-weekday, the remaining 364 days can easily be adjusted so as to make the months and quarters more uniform. The method most favoured by astronomers, Church people and other learned men, as well as by business people in this country, is to make the four quarters all have 91 days, with three months of 31, 30 and 30 days each.

Some people would like to divide these 364 days into thirteen months instead of the traditional twelve, by adding a new month of twenty-eight days, called "Sol," in the middle. But it is not likely that Parliament or any other body would accept such a drastic alteration, which in fact has little to recommend it. All the necessary measures of reform can be arrived at without disturbing Caesar's well-tried Twelvemonth.

MORE PROGRESS IN MEXICO

MEXICAN interest in calendar reform moves forward rapidly through high official channels. During the past month, two important conferences of cabinet members and other governmental leaders have been held in the office of the Minister for Foreign Affairs, Dr. Eduardo Hay. General agreement was reached at the first meeting as to the desirability of calendar reform. At the second meeting, a larger gathering of Mexican officialdom endorsed the verdict of the previous session, and discussed the comparative merits of the two plans of revision submitted by the League of Nations. Full official backing for The World Calendar plan is expected at a third meeting, and this will be followed by instructions to Mexico's delegate at the League of Nations.

ROMANCE OF THE CALENDAR

By P. W. Wilson

CHAPTER FOUR: THE CELESTIAL CLOCK

HOW was it that man evolved the calendar as a charter of coincidence? He achieved this purpose by cultivating the habit of thinking about that which is beyond himself, and many have been his calculations of time. There were days when flowers began to bloom, when butterflies broke from the chrysalis, when leaves fell from the trees. The Japanese celebrate the bursting of the blossoms on the cherry tree and other seasonal splendors. Botany—for instance, in early Greece—afforded a basis for some kind of a calendar, but it was a variable basis. Flowers bloom in the Spring—not however on a definite day.

Rivers were no more reliable. In Egypt, the Nile begins to rise in the middle of June. The great stream has thus spread a fairly definite solar year over the land of Egypt. But of what use to the Mesopotamian calendar would be the floods of the Euphrates? Nobody can say when precisely they will come.

So with the tides. They are regular. But they can only be observed on the seaboard. They have been useless—especially in days before rapid locomotion had been developed—as a calendar for inland communities.

What about the weather? Over much of southern Asia, the prevailing wind blows southwest from May to November and northeast from November to May. The Arabs thus call it the monsoon—a word meaning season. But would not the weather of Europe or of America afford a very speculative time table for the seasons?

Botany, hydrography, climate were thus found to be of limited value as a foundation for the calendar, and man—forgetting his rivalries, his enmities, his prejudices—has had to raise his eyes above a limited horizon to infinities beyond him. He gazes into the heavens "thick inlaid with patines of fine gold" where shine those "blessed candles of the night" by which time can be measured according to standards that are independent of human affairs.

For a child, it is a wonderful moment when he is invited for the first time to look at a watch and listen to its ticking close to the attentive ear. The case of the watch is opened and the infant peers with solemn eyes into the mysteries of the delicate mechanism—the wheels that move on jewelled axes, the wheels that do not seem to move at all, the quickly oscillating escapement, the hair-spring that pulsates like a living organism. This rapt countenance of a child thus absorbed in contemplation of what later will become a familiar possession suggests an attitude of wor-

ship, and this was the attitude of the men who, in successive centuries, moulded the calendar. It was as children that they gazed, day and night on the celestial timepiece, nor can we appreciate the processes whereby the calendar was evolved unless we try to see the universe as they saw it who dwelt on our planet thousands of years ago.

The heavens above them seemed to be one vast dial of a clock—but with this significant difference: The dial was splendidly and bewilderingly transparent. The enquiring eye looked not alone upon whatever in the sky might serve as pointers that tell the time. The vision was adorned by glorious irrelevancies. Man was fascinated and confused by the spectacle of a perpetual motion above him that was as elaborate as it was inexplicable.

The very perspective of the heavens—apparently a vault, actually an infinity—was deceiving. It was not the magnitude of a celestial body that determined its importance. Proximity to the earth—that was the deciding factor. A transient meteorite might weigh no more than a ton or two. Yet, flaming like a rocket, it outshone a cluster of stars billions of times greater than itself. In size, a planet is comparatively insignificant. But its placid and untwinkling disk mirrors an illumination that leaves the seven stars of Orion in a remote obscurity.

The science of astronomy is today marvellously elaborated. There are observatories—about 300 of them in active operation—which, like the multiple vision of an insect, glance in all directions at once. As the earth rolls round and round within the empyrean, every longitude and all save arctic latitudes are sentinelled by a cordon of sleepless watchmen of the night.

In magnitude, in complexity, in correctitude, where will we find any machine, even a printing machine or a locomotive—that can be compared with the coordinated intricacies of the greater among modern observatories? Here is much more than a telescope, however colossal may be that great instrument of vision. An observatory is a complicated mechanism of moving platforms under a revolving roof, of clocks and cameras and card indices, of microscopes in focus upon crossed lines spun by spiders, of logarithmic libraries of statistics. So powerful in its range is the observatory, yet so delicate in its adjustments that it might almost be described as the elephant of modern research. The elephant lifts a log, yet can pick up a pin, and so it is with the observatory. It surveys the infinite. Yet it discerns the infinitesimal.

Every few years, the telescope reaches what appears to be a maximum. It did not seem as if megalomania itself would be able to add size to the huge reflector on Mount Wilson which is 100 inches from rim to rim. Yet a mirror with a diameter of 200 inches—nearly 17 feet—has been cast for a telescope at Pasadena, also in California—a mirror that is 27 inches thick and weighs 20 tons. It is by far the greatest volume of glass ever

poured into one mould and the glass has to be perfect. Merely to cool the mirror is thus a process that continues over a period not far short of a year.

Such a reflector is like a wide-spreading net that catches scattered rays of light, and with such comprehensive capacity that it concentrates on the lens of the telescope a visibility which is 360,000 times that of the unaided eye. Telescopes had shown—let us say—about 500,000 stars. The new telescope may show three times that number.

The exactitudes of modern astronomy are thus astonishing. We realize that every moving body influences every other moving body and that no motion anywhere is absolutely uniform, whether in speed or in direction. The earth revolves on its axis. But its revolutions are accelerated or retarded. It sweeps round the sun once a year. But not in a perfect circle. The moon has its orbit around the earth. But it loses a second every three thousand years. There are no fixed stars. All of them are changing their relative positions.

But when was it that the marvellous machinery of modern astronomy first began to be made available for scientific use? We need not enter into the vexed question whether this man or that man—Descartes in France or Lippershinn and Jansen, who manufactured spectacles at Middleburgh in Holland, or Metius of Alckmaer, who amused himself with burning lenses of glass and ice and accidentally placed a concave and a convex lens at the end of a tube—should be accorded the honor of inventing the telescope. Enough for us that it was Galileo who first applied the telescope to the pursuit of astronomy—that his three successive and rudimentary instruments merely magnified a distant object respectively three times, eight times and thirty times. At no previous date was there any use of the telescope.

It is to the prolific period of Galileo that we must also attribute the microscope, and in 1614, John Napier, a Scotsman, published the first table of logarithms. Kepler actually anticipated telephotography. But the general use of the camera came much later—indeed, within living memory —and so with the spectrum. Only in 1672 did Newton notice that light, passing through a prism, was broken into the colors of the rainbow and spectroscopic analysis of the rays from stars is among the latest of astronomical researches.

We are thus confronted by what is surely a somewhat astounding paradox. The calendar, derived from the sun, moon and stars, dates from the dawn of history. Yet the mechanics of astronomy by which in these days we study the sun, moon and stars are no more than three hundred years old. Little or nothing of it was known at an earlier period. Astronomy is thus the one science that may be said to have antedated its own equipment.

We read accounts of ancient observatories which are said to have been very wonderful. Are there not more or less vague traditions of such observatories in classical times? May not the Egyptians have used the Pyramids for some astronomical purpose? Have there not been exquisite astronomical instruments at Pekin? Did not Tycho Brahe build for himself an elaborate observatory at a mansion in the island of Hveen off Denmark which he called Uranienbourg?

There were such observatories and doubtless they were furnished with beautiful instruments. Astronomy, like war and industry and religion, was pursued—especially in mediaeval times—not merely as an occupation but as an art. If the mediaeval craftsmen made armour—whatever they made—they were not satisfied unless they had covered their handiwork with ornament which had and still has a high aesthetic value. So was it with instruments used by the astronomer.

But when we examine the actual utility of these beautiful affairs, what do we discover? They serve two purposes, and each of the purposes is elementary. First, they provide what is equivalent to a stone set in the ground, from which light can throw a shadow that moves and can be measured. Secondly, they provide the equivalent of a stick that man can apply to his eye and aim at a distant object. The stone with its shadow and the stick with its direction—these were the elementary weapons with which alone man was accoutred as he set forth on his expedition to conquer his universe. Until a recent period, they were man's only weapons.

On the highlands around Cuzco in southern Peru—more than 11,000 feet above sea level—the Incas raised cylindrical pillars and, by measuring the sun's shadow, they calculated the solstices. In order to arrive at the equinoxes, they set a pillar in the center of a circle across which was marked a diameter, east and west. When the shadow was at a minimum—writes Prescott, the historian of Peru—they declared that "the god sat with all his light upon the column." On the occasion of an equinox, "the pillar was crowned by the golden chair of the sun, and both then and at the solstices the columns were hung with garlands, and offerings of fruit and flowers were made, while high festival was kept throughout the empire." Quito lies immediately under the equator, and here, says Prescott, the vertical rays of the sun threw no shadow at noon. For this reason the city "was held in especial veneration as the abode of the great deity."

The stone with its shadow is familiar to us in the sundial by which we tell the time of day. The stick pointing at the sun has been developed into a somewhat more elaborate affair. Of all the innumerable instruments perfected by man, the oldest, it is said, was devised for the measurement of time. It is the astrolabe and appears to be of Greek origin. Did Apolonnius of Perga invent it about the year 240 before Christ? Or was it invented B.C. 150 or thereabouts—by the greatest of Hellenic astron-

omers, Hipparchus? In any event the astrolabe—after more than 2000 years of use—is still valuable for educational purposes at Oxford.

It is a beautiful instrument, greatly valued by collectors, and consists of a circular disk that hangs steadily from a point on its circumference, or is set on a pedestal. A pointer with sights turns upon the center of the circle as an axis and is directed to the sun. There are wheels within wheels—exquisite in their precision—which can be adjusted like a slide rule according to the date, and the pointer thus corrected shows the time of day on the rim of the disk. It was by means of the astrolabe that the Wise Men who followed the Star read the celestial timepiece.

The makers of the calendar were thus compelled to rely on what the mathematician calls a first approximation of accuracy. And it was enough. Let us suppose that human history extends over 9000 years. Within that period the moon has only lost three seconds.

Not only are we able in these days to determine with extreme accuracy the motions of the celestial bodies; we can interpret those motions according to a simple and convincing formula. Every schoolboy knows that the earth turns on its axis and moves round the sun, which revolutions explain the appearance of the celestial sky.

But when was it that so simple a solution of an age-long riddle was announced? Not until the sixteenth century—about four hundred years ago. The makers of the calendar had no Copernicus to preface the way for them. Their minds were confused by the Ptolemaic system, according to which it was assumed that the sun and the stars in their courses move round the world. They saw in the heavens what we see. But they saw it, as we might say, backwards, nor could they discover any logical reason for what they saw. The very word that they applied to a planet means wanderer. A planet was a star that had lost its way.

APPROVAL FROM AMERICAN SCIENTISTS

From HENRY B. WARD

Secretary, American Association for the Advancement of Science

RESOLUTIONS passed by the Council of the American Association for the Advancement of Science at its St. Louis meeting on December 30, 1935, were as follows:

"WHEREAS this Association is already on record as approving a simplification of the calendar; and WHEREAS the League of Nations in 1931 proposed two plans for serious consideration: one, the 13-month plan; the other, the 12-month equal-quarters plan known as The World Calendar; and WHEREAS the 12-month equal-quarters plan has the advantages of a minimum of disturbance of the present system and greater flexibility in subdivision of the year; be it therefore

"RESOLVED, that the American Association for the Advancement of Science approves the 12-month equal-quarters plan for the simplification of the calendar."

EXCERPTS AND REVIEWS

France for Rational Plan

By PAUL LOUIS HERVIER

Secretary of the Bureau d'Etudes, Paris

(From an article in Franco American Trade, October, 1935)

IN THE midst of all the scientific adaptations whereby man's daily life has been modified, the calendar is one of the rare antiquities which is still accepted with respectful resignation. Is it not surprising, almost inconceivable, that we should accept in 1935 the arrogant fancy of the Emperor Augustus, who in lengthening his month of August, upset the labors of Sosigenes, astronomer-collaborator of Julius Caesar?

Transportation, telephone, telegraph, radio and modern machinery have revolutionized all other old habits and customs, but we continue to support the consequences of that vain act.

To adapt the calendar to present conditions of existence is a wise reform. When the League of Nations a few years ago received an avalanche of calendar reform projects—mostly fanciful propositions, the very diversity of plans retarded immediate action. So many solutions gave rise to so many arguments that the entente appeared difficult to attain, and it became advisable to educate the public regarding the obscurities of a problem thus badly presented. But the League of Nations manifested its favor for two projects, the Comte proposal for a 13-month year and the alternative plan for a 12-month equal-quarter calendar. Although the former was supported by a powerful organization well versed in the art of propaganda, the 13-month plan fell far short of capturing unanimous approval. Nearly all French Chambers of Commerce rejected it.

But the 12-month revision presents advantages for all classes of society, providing a rational division the benefits of which are numerous and durable. The perpetual quality of the proposed calendar permits of improved comparisons of the results of effort and expenditure, of establishing improved budgets and statistics, of proceeding with exact comparisons between months, quarters and half-years. It permits of better observations based upon experience. The most ardent advocates of this rational calendar are the educators of the young generations, professors and schoolmasters who immediately see the advantages of regular periods and schedules, avoiding those unforeseen "ponts" which now interrupt the course of studies.

The more we study the 12-month revision the more we must recognize the advantages which will accrue to the entire population. Among all the projects received by the League of Nations, none other presents such attractive and persuasive qualities.

Welcoming a New System

By WALDEMAR KAEMPFFERT

Science Editor of the New York *Times*

PUBLIC opinion in favor of calendar reform is gradually becoming articulate. Some day civilized nations will have a calendar which will meet the requirements of business men, schools and the church, and which need not be referred to on some wall or desk in order to find out on what day of the week the new month or the new year falls.

But what calendar shall we adopt? An international league is all for the 13-month plan; The World Calendar Association is championing a scientifically constructed 12-month system. For a time it seemed as if the 13-monthers would win. Now support seems to be swinging to the 12-monthers.

The world is so wedded to a 12-month calendar that one based on any other division of the year could be adopted only if all countries were governed by Hitlers and Mussolinis who would agree to enforce it.

At a meeting held on October 4, the American Philosophical Society passed a resolution welcoming the adoption of the 12-month plan. The Philosophical Society is not alone in advocating The World Calendar. Bishop Manning saw to it that it was unanimously adopted by the General Convention of the Protestant Episcopal Church. The Chamber of Commerce of the State of New York has recently

endorsed it. The American Statistical Association voted 70 per cent in favor of it as opposed to the 13-month plan.

What Is "God's Time"?

By Floyd J. Miller

In the Royal Oak (Mich.) Tribune

LAST SUMMER I asked a visiting stranger whether his town ran on standard or daylight saving time; slow or fast time, as some say. He replied pertly: "We don't take to these newfangled ideas of monkeying with the clock. We stick to God's time."

Of course the stalwart old gentleman was wrong. Eastern Standard time is no more God's time than is daylight saving. But to him, time as he had always known it was God's time; and if the method used all his life was that established by some fallible human beings a few decades back, he was unaware of it. To him it was God's time and he was against any change.

That is the situation with regard to our present awkward calendar. The majority of people are content to ride along with it because it has always been that way. It never occurs to them that great inconveniences could be obviated by changing it and improving it.

Many leaders, however, have been working for several years to devise a better calendar and to sell the idea to the civilized world. The plan known as The World Calendar seems to me the most logical and convenient which has been offered. Regularity is what the calendar needs. If we could have our months the same length and arrangement each year, the holidays, our birthdays and other anniversaries would come in the same place each year. There is no apparent sense in the present arrangement.

Appeal by Radio

By Commander Stephen King-Hall

British Editor and Author

(From an Article in the London Radio Times)

HAVE YOU ever taken a calendar of the year and looked at it critically? Has it ever occurred to you that our present calendar is not fixed or perpetual? For example, your birthday or any other anniversary falls on Monday one year, Tuesday the next year, and so on. The months contain from 28 to 31 days, and to remember which months have which days one has to learn a jingle or do sums on one's knuckles. The quarters of the year are not quarters at all, because the first contains 90 days, the second 91, and the third and fourth are each made up of 92 days. The first half-year is a fraud, because it contains two or three days fewer than the second half.

In short, the calendar which one would expect to be a neat, tidy and accurate way of dividing up time, is really a makeshift.

Most of us take our calendar for granted, but there are always active people in the world who see things. In 1923 the League of Nations started inquiring into the whole matter and in 1931 it held a conference attended by delegates from 44 nations. A special committee of the League was instructed to continue to enlighten public opinion on this social and economic problem.

For a Fixed Easter

By W. V. Noble

In the Manchester (England) News

FIX EASTER! It is a world-wide cry. It is a cry started hundreds of years ago, and which in recent years has been taken up by the Church and State, by business and educational authorities, and by the League of Nations. Yet Easter remains a movable feast.

The changing date of Easter, the most important festival in the Christian year, has caused international conferences — civil and ecclesiastical — and has even caused bloodshed; it has been the subject of a Parliamentary Act, has been referred to the Pope, and has a long history of argument.

As long ago as A.D. 325 plans were afoot to make Easter less capricious, and at regular intervals since then the question has been raised all over the world. But it has proved one of the most difficult questions which anybody has to face; so difficult, in fact, that although an Act has been passed in this country to fix the date it has not yet been enforced.

It is a question on which there must be the agreement not only of countries but of religious bodies.

CURRENT PRESS COMMENT

Stabilizing the Week

Providence Journal

The fact that Christmas and New Year were mid-week occurrences this season has been advanced as an argument in favor of the revised calendar advocated by The World Calendar Association. Under that plan, every Christmas would come on Monday and every New Year's on Sunday, an arrangement that seems desirable. It is the present hope to have this new calendar adopted by international agreement in time to be put into effect in 1939, when the first of January falls on Sunday.

Advocates of the 13-month calendar are still standing for their eccentric proposals. Of course the 12-month system advocated by The World Calendar Association is preferable to any other. Talk of an additional month is nonsensical.

Mexico's Position

Schenectady Gazette

Mexico's governmental approval of the 12-month World Calendar gives further impetus to the drive for reform of our present system and adds one more nation to the growing list of those favoring the change. The Mexican report finds that calendar irregularities hinder both government and business in Mexico, and declares that the proposed change to a unified 12-month plan would not disturb the present year.

In view of the notable advances made toward the goal during the past year, it will be interesting to note the progress which will come at the impending quadrennial session of the League of Nations section in charge of this matter.

Serious World Study

New York Times

In a discordant world the calendar is a "miracle of unanimity." All the peoples of the earth, whatever their local customs of reckoning, have to bring themselves in their relations with one another to the same planetary calculator and "common arbitrator." Telegraph, telephone, radio and other means of swift communication are increasingly bringing all to one system of determining "how many days will finish up the year."

With all this unanimity there is a widespread demand for the improvement or reform of the present calendar. Two plans have been urged. It is worthy of special note that the American Philosophical Society, with a membership of 500 selected from among men of greatest eminence in science, letters and the liberal arts, has recently expressed its preference for the 12-month plan. The new year should give the proposed change its serious world study.

Vatican Viewpoints

Catholic Register

What calendar reformers would like to see would be, in the first place, a year in which movable feasts are fixed. The Catholic Church is interested, and there is no doctrinal reason why the dates of Easter should fluctuate. The Holy See takes a conservative attitude, wishing to be sure there is a universal desire for calendar reform before endorsing it. A very authoritative Catholic scholar, Abbot Cabrol of Farnborough Abbey, England, is supporting calendar reform and has presented a memorial to the Holy See. If a change is made, it will probably come into effect in 1939.

Leap Year Suggestions

Canadian Packet and Times

This is leap year. February will have 29 days. It may be the last time that the extra leap day will fall in February, if the League of Nations should succeed in bringing about calendar reform.

Calendar reform would give so many advantages, and is so comparatively simple and easy to carry out that it will be a pity if the League fails to get the necessary support. Yet we are warned by past experience that such reforms, no matter how rational and desirable, have to overcome a great deal of prejudice.

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EDITORS

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ELISABETH ACHELIS, *President*

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DEVELOPMENTS in the movement for a revision of the Gregorian calendar since the Fourth International Conference at Geneva in 1931 have been important and far-reaching. They will come up for official review and appraisal at the Fifth International Conference (of the League of Nations Commission on Communications and Transit), to be held early in the coming autumn.

Postponed from last year owing to the plans for internal reorganization of the Commission on Communications and Transit, the quadrennial conference this fall will find the forces supporting calendar reform reinforced by many important official bodies and governments.

These steps in progress have been chronicled from time to time by the Journal of Calendar Reform. Some of the most recent and most important of them are recounted in this issue,—particularly the definite pronouncement of the British Government in the House of Lords.

Organization of a new official German committee for the advancement of calendar reform has been going forward for some time, with the support of the Ministry of the Interior. In Latin America the coordination of many national groups is evidenced by the action of the recent Labor Conference in Santiago.

Progress in the United States during the past months has been chiefly in business, scientific, educational and religious groups. The action of the American Association for the Advancement of Science completes a long series of resolutions by scientific groups and gives the highest leadership to the movement for a new calendar. Educational leaders are preparing to give the support of the National Education Association to calendar reform and in religious circles, the American Section of the Universal Christian Council will probably present its official report to the government in Washington.

RECENT CALENDAR RESEARCH

Babylonian Time Measures

By J. B. Perry Robinson

Secy. National Calendar Assn., London

RECENT British research in calendar reform has shed some interesting light on the origin of the observance of the seventh day as a day of rest, recreation and worship. In the history of Christianity, it is shown that Constantine the Great in promulgating the official religion for his empire ordained the seventh day as a day of rest, primarily for reasons of public health, public welfare and sound economics. Neither he nor any of the Early Fathers appear to have regarded this "Lord's Day" as in any sense a perpetuation of the Jewish Sabbath. To them it was a commemoration of the Resurrection, and this is why they chose Sunday, rather than the Jewish Saturday.

As for the Jewish observance, recent British scholarship has definitely set aside the tradition that it was kept continuously and uninterruptedly from the time of Moses. In fact, the ritualistic observance of the Jewish Sabbath had its origin during the Exile, about the Sixth Century, B. C.

The following summary of the results of recent research have been made public through the Rational Calendar Association by Professor Langdon of Oxford:

"The dominant religious influence throughout the whole of the Near East during the formative period of Hebrew civilization—from the establishment of the Kingdom until the post-exilic hierarchy of the Sixth Century—was that of Babylon," says Prof. Langdon. "The great Sumerian agriculture cults of Tammuz, crystallizing at Babylon at the end of the third millennium B. C., were the basis of Hebrew religious worship and observance as of the Greek and the Christian.

"In such agricultural religions the calendar is of greatest importance, and as the religions spread, calendar goes with them.

"It is undisputed that from the time of the Exile (586 B. C.) the Jews were using the Babylonian month-names (the Nisan series) in their calendar, together with the Babylonian method of computing the year. The ancient Canaanite months which the Jews used were supplanted.

"The Babylonian months were lunar months, and one or two days were frequently intercalated after the four-week cycle in order to make each month begin with the first day of the new moon.

"The Babylonian religion developed a principle of periodic days on which, particularly, any work of healing and any work for profit or pleasure were discouraged. These days became fixed on the days 7, 14, 19, 21, 28 (and days 29 and 30 if intercalated), in every month, and in the nature of the observance of them, they bear a strong resemblance to Jewish Sabbath and Protestant Sunday.

"The probability that the Jews adopted this principle of 'rest days' at the same time as they adopted the Babylonian month-names is strengthened by the fact that they also derived the word 'Sabbath' from Babylon. In Babylon 'sabattu' did not mean a rest day but a day of division, e. g. the 15th day in the month, the day dividing the two halves of the month. Nevertheless this is undoubtedly the origin of the word 'Sabbath,' although at first the Jews themselves sometimes, as in Leviticus XVI, 31, used it in the Babylonian sense of the 15th day, as distinct from its subsequent meaning of the seventh day of rest.

"Assuming that the Jews adopted the Babylonian series of rest days, together with the Babylonian month-names and method of calculating the length of the months, it follows that the intercalated days necessary to make the months and the years begin with new moons must at the same time have periodically widened the interval between one Sabbath and the next to more than seven days."

World Impetus for Revision

By Anton W. Wilson

(In *Scientia*)

PROPOSALS for a change in the calendar have acquired a keen interest to the civilized world since the conference of the League of Nations in 1931. Efforts

are being made to insure the enactment of the new calendar by 1939, when Sunday comes on January first. The next time when Sunday falls in this position will be in 1950, and there are many who think that so long a delay would be injurious.

The calendar has always been the object of proposals for change, and most of the revisions which have been adopted have been definite improvements. Reasons for another revision at the present time are that world conditions today are greatly different from those which existed formerly. Commerce, government and communication exact a greater uniformity and regularity in time division. Comparative statistics have greatly increased importance and are destined to aid future generations in directing the destinies of civilization. Even in religious matters, there are epochal changes: many religious feasts were formerly celebrated during the period of the full moon, so that the pilgrims traveling at night might be guided and protected by the moonlight. It was impossible then to adopt fixed dates for these feasts, but today the situation is entirely different.

The aims of the League's proposals for revision are to eliminate the defects of the present calendar and to establish a system which will give humanity the most fixed and permanent calendar which is possible.

Defects which are universally recognized are as follows: (1) Weekdays and their corresponding month-days vary from year to year; (2) Months are unnecessarily unequal in length; (3) No two months of the year are alike; (4) The quarters are unequal and dissimilar in make-up; (5) Months have not the same number of working days; (6) Comparative statistics for similar periods in different years are inaccurate and misleading.

In the present calendar, 28 varieties of months are possible.

An absolutely perfect calendar is mathematically impossible, but it is possible to establish one with fewer defects than the present one.

Any revision of the calendar should aim at bringing about its changes in the simplest possible way, with the least possible confusion and disturbance in the transition period. Revision is inevitable.

Jesuit Viewpoint

By The Rev. Feliciano de Vicinay, S.J.

(From *Digest of Synodal Commission*, Peking, China)

IT would be quite simple to reform our present calendar in accordance with the 12-month plan known as The World Calendar. All that would be necessary would be to choose a year beginning with Sunday (1939, for example), and put the new calendar into effect. There would be hardly any perceptible interference with dates, but a great convenience would immediately result.

Studies of calendar reform available to Chinese students include the researches of Father Dugout, one of the victims of Nanking (March, 1927), who published a monograph in 1917. Father Dugout suggests a renaming of the months, to make the names internationally uniform, and recommends the Chinese method of naming the months according to their numerical position. A scholar named Reininghaus has suggested that all nations adopt the following nomenclature: Prim, Sekund, Terz, Quart, etc.

China is interested in calendar reform because of the country's existing calendar difficulties, as well as the fact that the nation includes more than 500,000,000 inhabitants, nearly a third of the world's population. The Chinese people have two calendars, their ancient lunar calendar, and a solar calendar that follows the astronomical months exactly. It is true that officially the lunar calendar was abolished with the coming of the republic, and replaced with the Gregorian system. The Nationalist government worked hard to put this substitution into effect, strictly forbidding the printing and sale of the old calendar and refusing legal recognition to documents and contracts dated according to the ancient system. But the lunar calendar is still imbedded in the customs of the Chinese people

The proposed 13-month calendar would encounter unconquerable opposition in China. On the other hand, the revised 12-month system would not be opposed, but would actually form a basis for gradual and ultimate general acceptance.

FROM THE MAILBAG

I think the plan you are sponsoring is less radical than the other, and much more feasible of adoption. I think, also, that it has great advantage from a manufacturing, business, governmental and accounting standpoint, as well as private and personal viewpoints, so I heartily endorse the resolution of the Chamber of Commerce and the work you are doing in promoting it.—Gerard Swope, Pres., General Electric Co., New York.

The "12-month equal-quarter" plan can be adopted by the Churches quite readily. —Rev. H. L. Lonsdale, New York.

I am greatly interested and heartily in favor of your plan, advocating it whenever I have any opportunity to do so.—Prof. A. Toth, Lancaster, Pa.

The 13-month proposition I regard as so absurd as to be unworthy of serious consideration. Some years ago I talked with one of its advocates about it, when he visited the Comptroller's office of the Pennsylvania Railroad, with which I then held an official position, but his arguments did not appeal to me; nor could I see any particular business advantages that could not be equally well secured in other ways and without disturbing the accepted arrangement of the calendar.—H. B. Rumrill, Tredyffrin Observatory, Berwyn, Pa.

Although the 13-month plan has already created opposition to any plan, the opposition can be overcome by an intelligent exposition of the 12-month plan, the only sensible proposition looking to calendar reform.—Rev. C. L. Reynolds, Newark, N. J.

I am heartily in sympathy with The World Calendar plan.—Prof. G. A. Baitsell, Yale University.

At the annual meeting of the Florida State Pharmaceutical Association I presented a study on Calendar Reform.—T. R. Leigh, Chairman, Committee on Calendar Reform, Florida State Pharmaceutical Assn., Gainesville, Fla.

Your whole proposition is eminently reasonable and should be adopted. You can depend on my active support.—D. C. Kerr, Accountant, Salt Lake City.

The 12-month plan would make less confusion; few from the social standpoint would ever know the difference. Few people without a rhyme know now which are the 30 and which the 31 day months.—Rev. R. S. Wightman, Maywood, N. J.

I heartily approve of the new 12-month calendar since it leaves the year's quarters and halves intact, gives a fixed Easter, and would less disturb present conditions and calculations.—W. H. Fite, Mt. Vernon, Ky.

The sooner The World Calendar is introduced the better for Church, State and business.—Karl Kretzmann (Clergyman), Orange, N. J.

I am familiar with the project for reform of the Gregorian Calendar, and I have hopes that, *servatis servandis*, it may come to pass. — Ferdinando Bussolari, Archbishop of Modena, Italy.

As a student of calendar reform, I have used information from your Journal for public addresses. — C. D. Peake, Mission, Texas.

I should like to see any and all honorable means used to hasten the adoption of the 12-month plan. Nothing is to be gained by delay.—Rev. H. P. Metcalf, Madison, Ohio.

Very much in favor of World 12-month calendar.—C. J. Longbotham, Globe Oil & Refining Co., Minneapolis.

Hoping that your expectation of calendar reform will be fulfilled.—A. B. Kalian, Archbishop, Syrian Church, Baghdad (Iraq).

I formerly favored the 13-month plan, but it seems cumbersome. As I weigh the issue right now the revised 12-month ought to be considerd.—Rev. P. E. Carsan, Struthers, Ohio.

In the matter of education and publicity the churches could have a valuable part.—Rev. E. C. Nielsen, Valley Falls, Kan.

I have been interested in calendar reform for many years and have long since decided against the 13-month calendar for scientific, commercial, social, and religious reasons.—Col. F. E. Johnston, Washington, D. C.

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Membership is based on active interest in the study of adequate and effective improvement of the calendar. Owing to lack of space, a large number of names have been omitted. They will be printed in future issues.

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BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

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LABOR TAKES A STAND

Resolutions Adopted by Labor Conference of the American States, Santiago, Chile, Jan. 14, 1936

The resolution was proposed by Dr. Gaston Goyeneche, delegate of Chile, and was supported in committee by delegates of the United States, Argentina, Brazil, Bolivia, Colombia, Costa Rica, Mexico, Panama, Peru, Uruguay, etc. It was passed unanimously in plenary session.

SPANISH TEXT

¶ **CONSIDERANDO QUE,** en la *Undécima sesión de la Conferencia Internacional del Trabajo,* celebrada en junio de 1928, se aprobó una moción en favor de la *Reforma del Calendario,* fundada en "*el interés que este asunto tiene para los obreros, por su relación con los problemas de perfeccionamiento del trabajo y de las estadísticas industriales, estabilidad en los destinos y regularización de los días de fiesta*"; y

¶ **CONSIDERANDO QUE,** la *Secretaría de la Liga de las Naciones* ha pedido a la *Oficina Internacional del Trabajo* que le comunique periódicamente cualquiera información que pueda obtener sobre la opinión que esta materia le merezca a los trabajadores; y

¶ **CONSIDERANDO QUE,** es un hecho ya bien reconocido que nuestro *Calendario* actual es muy poco satisfactorio para su aplicación en los campos económicos, sociales y religiosos, y que recientes estudios, investigaciones e informes nos revelan que hay visible anhelo para llevar a cabo su revisión; y

¶ **CONSIDERANDO QUE,** la *Reforma del Calendario,* fundada en el plan de *12 meses y trimestres iguales,* es de gran conveniencia para la vida comercial y de los negocios, como también para el bienestar de las clases trabajadoras, y representa una ventaja de grandes beneficios para todas las naciones; y

¶ **CONSIDERANDO QUE,** este asunto debe ser estudiado por la *Liga de las Naciones en 1936, la Conferencia del Trabajo de los Estados de América, Miembros de la Organización, Internacional del Trabajo, reunida en Santiago de Chile, en enero de 1936,*

Resuelve: recomendar la aprobación del *Calendario Perpétuo de 12 meses y trimestres iguales,* y acuerda solicitar del *Consejo de Administración de la Oficina Internacional del Trabajo* que envie copias de esta resolución al *Secretario General de la Liga de las Naciones* y a todos los *Gobiernos de los paises americanos.*

ENGLISH TEXT

¶ **WHEREAS,** at the 11th International Labor Conference held in June, 1928, there was approved a motion in favor of the reform of the calendar, founded on "the interest that this matter has for the workers, because of its relation to the problems of the improvement of working conditions and industrial statistics, stabilization of employment, and regularization of holidays," and

¶ **WHEREAS,** the Secretariat of the League of Nations has requested the International Labor Office to communicate to the Secretariat any information that may be obtained regarding the opinion that the workers have about this matter, and

¶ **WHEREAS,** it is a fact already well recognized that our present calendar is not very satisfactory in its application to the economic, social and religious fields; and that recent studies, investigations, and information reveal to us that there is an evident desire to bring about its reform, and

¶ **WHEREAS,** the reform of the calendar founded on the plan of 12 months and equal quarters is of great convenience to commercial life and to business, as well as to the well-being of the working class, and it represents an advantage of great benefit to all nations, and

¶ **WHEREAS,** this matter must be considered by the League of Nations during 1936,

¶ **BE IT RESOLVED,** that the Labor Conference of American States, members of the International Labor Organization, meeting in Santiago, Chile, in January, 1936, recommends the approval of the perpetual calendar of 12 months and equal quarters; and it resolves to request the Administrative Council of the International Labor Organization to send copies of this resolution to the Secretary General of the League of Nations, and to all the Governments of the American countries.

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JOURNAL OF CALENDAR REFORM

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

FEBRUARY

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..

MARCH

S	M	T	W	T	F	S
..	..	..	..	..	1	2
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Second Quarter

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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29	30	31	..	..	..	..

MAY

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12	13	14	15	16	17	18
19	20	21	22	23	24	25
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JUNE

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
						**

Third Quarter

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

AUGUST

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..

SEPTEMBER

S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Fourth Quarter

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

NOVEMBER

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..

DECEMBER

S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
						*

*YEAR-END DAY, December Y, follows December 30th every year
**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance."—Robert Bridges.

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TIME MEASURES ON MARS

By ROBERT G. AITKEN

Former Director Lick Observatory

How would a man from Mars regard the calendar problems of his brethren on the planet Earth? This is the interesting and imaginative viewpoint from which the distinguished scientist, Dr. Aitken, approaches the subject of calendar reform.

A FEW days ago, while I was reading with special interest the announcement that the American Philosophical Society, like the American Academy of Arts and Sciences, had definitely endorsed the 12-month World Calendar, my friend, the Man from Mars, entered my office and, seeing the *Journal of Calendar Reform* and other papers on my desk, was moved to comment.

He expressed his surprise that the human race which prided itself upon its progressiveness, had so long been content to put up with the present hodge-podge calendar and that it should be so slow and hesitant about adopting the revision proposed by The World Calendar Association, a revision that would so obviously improve and simplify,—particularly since the adoption of the new system could be effected with so little inconvenience to anyone. He readily agreed that any plan of revision, to succeed, must commend itself to the Church as well as to the worlds of business and science. "But," said he, "now that the highest authorities in your great ritual churches, as well as so large a number of great business

organizations and scientific societies have expressed their approval of the 12-month World Calendar, I find it difficult to understand the reasons for further delay."

I tried to explain to him the power of tradition and the reluctance of the conservative element to give up an old custom or tradition in favor of a new one, even though the new one offered definite advantages. But this, he contended, was unreasonable. "It is all right," he said, "to heed the injunction of your great apostle Paul to 'hold fast that which is good,' but the apostle certainly did not and would not advise holding something that is not so good and that can so easily be made better." He wrinkled his oddly shaped brow and paused a moment to consider the matter.

"Of course," he continued, "it would be most convenient if your year contained an exact number of days, and if that number were exactly divisible both by 7 and by 12. But Dame Nature, if she be the responsible party, has been culpably indifferent to commensurability in the rotation periods and revolution periods of the Earth and of all of the other planets. Happily, this is of no consequence except for Mars and the Earth, for as we know, the other planets are uninhabitable, or at any rate uninhabited.

"Think of the tribulations of calendar makers on the planet Jupiter, if there were any! Not only are there about 10,500 Jovian days in the Jovian year, but if the equatorial acceleration in the rotation period, which we observe in the outer layers of its atmosphere, extends down to the layer on which the imaginary Jovians might be supposed to live, the number of days in the year varies with the latitude, and at the equator may be fully 90 greater than in high north and south latitudes." He smiled at the odd picture he had conjured up, and I smiled with him.

"Even with us Martians," he added, "it is bad enough, as you know, for your astronomers have measured the length of our day and of our year accurately in your units of time, just as we have measured the lengths of the Earth's day and year."

It is true that we know the lengths of the Martian day and year in mean solar days very precisely. Mars makes one sidereal rotation in 24 hours 37 minutes 22.58 seconds of mean solar (terrestrial) time, and one complete revolution about the Sun in 686.98 mean solar days. Expressed in units of *Martian* mean solar days, this means that the Martian sidereal year has 669.5999 days, and since on Mars, as on the Earth, sidereal time gains one full day on mean solar time in one revolution, that is, in one year, the Martian *calendar* year will have 668.60 days.

As compared with our 365.2564-day calendar year, this fractional number apparently has disadvantages but also advantages. I questioned my visitor on the subject. "Yes," said he, "the incommensurability raises a problem, and at a very early stage in our history this was fully realized and alternative possible solutions were vigorously debated. We wished, of

course, to keep our year dates in step with our seasons; and these, as you know, closely parallel your own, since the inclination of our equator to the plane of our orbit (25° 10′) is but little greater than the inclination of the terrestrial equator (23° 26′ 59″) to the plane of the ecliptic.

"Three schemes were considered. We might have four years of 669 days each, followed by one of but 667 days, or four years of 668 days each, followed by one with 671 days. By either plan we should have 3343 days in five years—what the actual rotation and revolution periods require.

"It was agreed, however, after full debate, that these plans were far inferior to the plan of having our years run alternately 668 and 669 days, and then inserting an extra leap-day every tenth year to care for the odd one-tenth of a day. We adopted this arrangement, which will keep our year dates in step with the seasons for more than 10,000 years.

"We divide our year into quarters, as you do, but make it begin with the date of the Vernal Equinox, and we insert the intercalary day required in the decennial years at midyear, between the second and third quarters, calling it *Mid-Year Day* and celebrating it as a holiday.

"Our years, then, run as follows:

	Spring	*Summer*	*Autumn*	*Winter*	
Days in Odd Years	167	167	167	167	= 668
Days in Even Years	167	167	167	168	= 669
Days in Decennial Years	167	167 (1)	167	168	= 670

"Even before we adopted this calendar we had found it desirable to set aside one day in seven as a rest day, such as your Sunday was designed to be. We have nothing on Mars that corresponds exactly to your lunar month, for, as you are aware, we have two satellites or Moons, the outer one of which makes one complete revolution in its orbit in about 1¼ of our days, while the inner one revolves nearly four times as fast, so that it actually rises in the west. It was, however, convenient to divide the seasons, or quarter years, into periods of a few weeks each, just as you divide yours into months, and it seemed to our calendar makers logical to continue the quarter system. Our year, therefore, has 16 periods of 42 or 41 days (6 weeks) each; all odd-numbered years begin on a *Sunday*, in your nomenclature, and all even-numbered years on a *Wednesday*. All four quarter periods of Spring in the odd-numbered years also begin on Sunday, those of Summer on Saturday, of Autumn on Friday, and of Winter on Thursday. In the even-numbered years, the quarter periods of Spring, Summer, Autumn and Winter begin, in order, on Wednesday, Tuesday, Monday and Sunday. Since the last quarter of the even-numbered years always has 42 days, the odd-numbered years again begin on a Sunday, and since the intercalary *Mid-Year Day* has no week-day name, this set-up is cyclical, so our calendar is perpetual *on a two-year basis.*

"Moreover, you will note that the first three quarter-periods of each season in both odd- and even-numbered years all have 36 working days per month (except for specially decreed holidays), and the last quarter-period in each season, 35 with, however, 36 in the last period of winter in *even-numbered years.*

"Here, then, is our Perpetual Calendar:

ODD-NUMBERED YEARS

Seasons	*Spring*		*Summer*		*Autumn*		*Winter*	
Quarters	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days
1	Sun.	42	Sat.	42	Fri.	42	Thur.	42
2	Sun.	42	Sat.	42	Fri.	42	Thur.	42
3	Sun.	42	Sat.	42	Fri.	42	Thur.	42
4	Sun.	41	Sat.	41	Fri.	41	Thur.	41

EVEN-NUMBERED YEARS

Seasons	*Spring*		*Summer*		*Autumn*		*Winter*	
Quarters	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days
1	Wed.	42	Tues.	42	Mon.	42	Sun.	42
2	Wed.	42	Tues.	42	Mon.	42	Sun.	42
3	Wed.	42	Tues.	42	Mon.	42	Sun.	42
4	Wed.	41	Tues.	41 Mid-Year Day*	Mon.	41	Sun.	42

*Mid-Year Day, a Holiday. Insert in all years whose number is divisible by 10.

"I have used your week-day names instead of our own for your convenience. You can readily see that this calendar, in this form or given in detail for all days in the year so that holidays may be noted, is not at all difficult to master and that it divides the quarters of the four seasons, and the number of working days in each season as evenly as is possible. Any set holiday, like your Christmas for example, will always fall upon the same week-day in odd-numbered years, and likewise in even-numbered years, though the week-day in the odd- and even-numbered years will differ by a fixed number of days."

Just then my visitor glanced at his watch and found that he had barely time to catch the next *Interplanetary Express* (which, incidentally, has as real an existence as my Martian friend himself) and hurried away, leaving me to ponder over the simple Martian calendar and to regret that on our Earth we have not yet been able to secure the adoption of the even simpler and better calendar proposed by The World Calendar Association.

Progress in recent months has been encouraging and it now seems that we may, with some reason, hope to see the 12-month World Calendar adopted in time to put it into actual use on Sunday, January 1, 1939.

RUSSIAN EXPERIMENTS

By THE RIGA CORRESPONDENT OF THE LONDON TIMES

AFTER long periods of experiment and change the calendar of Russia now appears to be stabilized again for the first time since the Bolshevists formed their Government in 1917. In the present system are several features which distinguish it from the calendars of other countries. The ordinary Soviet year of 365 days is divided into 12 months exactly as before the revolution; but the week has been distorted and reshaped several times. The system is now based on two parallel weeks, one having six, the other seven days. Labour and rest in Soviet towns and industrial regions are regulated by the six-day week. Five days are for work, one day for recreation. The rest days fall on the 6th, 12th, 18th, 24th, and 30th day of each month. March 1 takes the place of the fifth rest day of February, and there is an extra day in the week following the last rest day of the months which have 31 days.

The seven-day week as such is not mentioned in official language, though its existence as a shadow of the past is recognized by the continuance of the same names as were used in Tsarist times to denote the seven days of the week. These pre-revolution day names appear even at the head of *Pravda* and other daily newspapers. The rest day falls on Sunday one week, on Saturday the next, then Friday, and so on.

The parallel week system is aimed particularly at the Church and religion, and here, indeed, the authorities have succeeded in putting their quarry at sixes and sevens in a double sense, for how can a religious worker observe a regular day of worship when his rest day falls on a differently named day each week? The Church might come into line by adopting a six-day week, too, but such a step would be interpreted as counter-revolution.

The number of extra all-day holidays in Russia has now been fixed at five. They were much more numerous before the revolution and during the first 10 years of the Bolshevist régime, but they have been sacrificed ruthlessly to the exigencies of the industrialization plans. The first of these Red Bank Holidays is on January 22 and is known as Lenin's Day, though Lenin died on January 21. Formerly both days (January 21 and 22) were celebrated by a cessation of work at factories, as January 22 was the anniversary of the Father Gapon demonstration in 1905, when the police fired on the crowd outside the Winter Palace at St. Petersburg. Now the two festivals have been run into one. Curiously enough, Lenin's birthday on April 22 is not observed as a full holiday. The next general holiday is May Day, celebrated on May 1 and 2. The first day is set apart for

demonstrations, the second is a day of rest and recreation. November 7 and 8 are similarly used to celebrate the anniversary of the Bolshevist revolution, called the "October Revolution" as the date was October 25 by the Old Style or Julian Calendar then in use.

Besides the five Bolshevist Bank Holidays, there are 10 or 12 days which are still celebrated, though work is not stopped for this purpose. Three of them fall on the ordinary rest days of the six-day week, the others are observed by special articles in the Press and festivities after business hours. The chief of them are:—

New Year's Day, Red Army Day (February 23), International Women's Day (March 8), March Revolution Day (March 12), Lena Goldfields Memorial Day (April 17), International Sports Day (July 7), International Anti-War Day (August 1), Soviet Aviation Day (August 18), International Youth Day (September 1).

The calendar still includes also the Day of the Paris Commune, Peasants' International Day, Lenin's Birthday, Harvest Day, Cooperative Day, and others, but their celebration is luke-warm and does not involve a cessation of work. In contrast to the earlier period, work has now, indeed, become more important than holiday-making, and the celebration of extra rest days is discouraged. New Year's Day, for example, is a traditional holiday in Russia, and a large proportion of operatives continue to celebrate it whether their factories close or not. To cope with this "evil" without increasing the number of holidays the Government announced last December that the rest day of Dec. 30 should be transferred to Jan. 1.

Tampering with the calendar began as far back as 1918. Russia had remained true to the Julian Calendar, but the Revolution adopted the Gregorian instead, thus coming into line with Western countries. This was decidedly more convenient for international intercourse, but local authorities began to emulate the French Revolution and to show their revolutionary zeal by altering the names of the months and days, substituting the names of Pugacheff and Stenka Razin for Easter and Christmas, and making other changes in the spirit of the age. But when the Central Government obtained real control, all these local innovations were cancelled.

During the period of the New Economic Policy (1921-28) there was little interference with the calendar beyond the introduction of a few more "noteworthy revolutionary days." Official almanacs of that period show a curious mixture of revolution and religion. Religious festivals survived in Soviet almanacs until 1929; but in 1930 the words Easter, Christmas, Whitsuntide, and all the other feast days were expunged from the calendar. The names of saints recognized by the Orthodox Russian Church were condoned and printed by Soviet authorities for several years longer. Even as late as 1931 the official almanacs, printed in hundreds of thousands, recorded the "name days" of saints for every day of the year in

much the same way as they were noted under the Tsars. But new names were added which are not usually associated with saints and religion. Thus, against the date April 22 we have: Vsevolod, Clement, Vladlen (a new name formed by telescoping Vladimir and Lenin); Vladlen appears also against January 30; January 1 has Vasili and Spartacus; January 22, Timothy and Marseillaise. Other new names added to the saints of the calendar are: Octvabrina (October), Communar, Brutus, Avieta, Marat, Altai, Lena, Electra, and Ninel (Lenin spelt backwards).

The Central Government at Moscow made its first determined assault on the seven-day week in September 1929, with a decree ordering the general introduction of a five-day week. The avowed purpose of this reform was to combat religion by abolishing the common weekly rest-day. Factories were to be kept working incessantly day and night. The operatives were divided into five "colours," each having a red, blue, yellow, or other "labour calendar." On any given day or night four "colours" would be working, and the other "colour" enjoying or otherwise spending its day of rest. Thus the reds had their day off on the 1st, 6th, 11th, 16th, 21st, and 26th day of each month, the blues on the 2nd, 7th, 12th, and so on. A man and wife would never have the same day free unless they managed to get the same colour. If there were more members in the family it became still more difficult to synchronize the rest days, and the plan served the additional purpose—then considered useful—of breaking up family life.

Experiments had been made with the five-day week since 1927, but after it became compulsory in 1929 the difficulties and discontent increased rapidly. The authorities then discovered that much of their anti-religious object could be attained without mixing up the rest days, and also the old idea had come to the fore again that family life was an institution to be fostered rather than destroyed. The colour system was abolished in 1932, the labour week lengthened to six days, and a common rest day reintroduced for all. Only certain public services and some shops now work on this day, but here, too, the workers have a six-day week; five days of work and one day free, though for the convenience of others their rest day does not coincide with that of the general public. Nearly all newspapers appear on five successive days and then miss a day; but *Pravda*, the central organ of the party, is published on all the six days of the Soviet week.

The seven-day week, with Sunday as a day of rest, is still holding out on the countryside, in spite of the advanced stage of collectivizing and industrializing rural husbandry, but it is viewed with official disfavor and is being superseded as fast as possible by the six-day labour week now firmly established in the towns. It may be added that, although the working week is shorter in Russia than elsewhere, there is no such thing as half-day work on Saturday or the day preceding the common day of rest.

LEAP YEAR'S FAREWELL

By Elsa Ford

LEAP YEAR has said its fond adieus to February. It is vacating its long lease of the 29th day of the second month and taking a new dwelling place between June and July. February 29, Leap Year Day, is dead. Bid it farewell. For the League of Nations now is considering a revised calendar and adoption of the new plan seems certain. When this much needed and universal reform is approved, the quadrennial extra day, atoning for calendar error, will be placed in the middle of the year. It will be an extra Saturday following June 30th, will bear the name of Leap Year Day and probably will be an international holiday.

Leap Year especially focuses our attention on the subject of error in the calendar, for its function is to keep the calendar in step with the seasons. It is the calendar "corrector." It was introduced for the very purpose of eliminating inevitable mathematical and astronomical errors.

It is extremely difficult to construct a calendar which will coincide exactly, within seconds with the tropic or seasonal year. This is due to the fact that the two revolutions involved in determining the length of the day and of the year bear no direct relationship to each other. The gears of the cosmic timepieces do not mesh perfectly and astronomers have to act as mechanics and oil the machinery to eliminate as much friction as possible. Leap Year is the lubricant which they use.

Our day is determined by one revolution of the earth on its own axis and one revolution of the earth around the sun constitutes a year. How convenient it would have been if this could have resulted in an even number of days in the year! But such is not the case. A solar year contains 365.24219879 days or 365 days, 5 hours, 48 minutes and 46 seconds. Leap Year takes care—almost—of those extra 5 hours, 48 minutes, 46 seconds.

From researches in the British Museum and the Cairo Museum, it has been discovered that the first appearance in Egypt of a Leap Year "rule" came late in the 1st century B. C. But long before that, the great mathematician-priests of that agricultural nation had seen the necessity for such a calendar stabilizer. Through determining the length of the solar year by means of the angles and shadows of the pyramids and by sighting fixed stars such as Sirius, the people of the Nile knew there were approximately 365¼ days in a solar year. The first solar calendar was constructed. It had months of 30 days each, 4 of which made a season, the three seasons being Flood Time, Seed Time, Harvest Time. The year was completed by five festival holidays and the fraction remaining was allowed to accumulate but carefully recorded.

The importance of Leap Year in the Egyptian calendar becomes apparent when one realizes that it was the prototype of the Julian and Gregorian calendars which formed the basis of our modern system of reckoning. The next important step in the history of the Leap Year came when Julius Caesar, combining scientific interest with military and amatory conquest, seized upon the Egyptian method of calendar calculation as a means for abolishing the manifold absurdities of the Roman calendar. But Caesar was not primarily interested in pure and abstruse scientific advancement. Oh, no! That skilled political strategist was concerned with increasing his own power as dictator of the Roman state.

Various absurd explanations of Roman calender reform appear all too often in the books of supposed authorities but the real explanation, based on our examination of the original sources, undoubtedly was Caesar's struggle to achieve and hold power. The pontiffs, regulators of the old Roman calendar, added or failed to add days as it pleased their fancy, their purses and their political aspirations. Under Roman traditions they set all dates for elections, public holidays and religious festivals. Caesar took this power out of their hands.

When he took the step, especially correcting the year-length irregularities by means of a regular Leap Year, he introduced to the western world the calendar calculation which has endured to our own day. The old Roman calendar of Romulus and Numa Pompilius, based on the moon, provided for a year of 355 days, too short by approximately 10¼ days. To correct this error, an extra month, alternately 22 and 23 days, was intercalated as an early Leap Year measure every other year between the 23rd and 24th of February. Over a four-year period, 45 days were added or 11¼ days a year, making 366¼ days as the mean value for the year's length. Each year was 1 day too long and this was corrected by means of a 24-year cycle. In the last eight years of the cycle, 66 days instead of 90 were added. It took the Romans a period of 24 years to obtain the approximate correct mean value of 365¼ days for the solar year.

Prior to Julius Caesar another attempt had been made to simplify the involved reckoning of Roman Leap Year rules. The intercalary month was abolished by the Decemviri and the pontiffs were given authority to insert, as necessary, a longer month called Mercedonius. Calendar confusion became worst confounded. The correct date for the vernal equinox is March 25. By Caesar's time, calendar errors by Roman reckoning had placed the vernal equinox in summer, on or about June 5. The Roman farmers had even more to complain of than our agriculturists today. For they didn't know if March would find snow or a scorching sun.

Then Caesar built a new body on the old calendar chassis and put on a Leap Year governor to stop the runaway seasons. Macrobius and the lesser-known Censorinus recount the feat. In his "The Natal Day," Censorinus writes, "As to the quarter of a day which it seems completes the true year, he (Julius Caesar) directed that one day be intercalated after each period of four years, where the month was formerly placed, that is after Terminalia (February 23) which is now called bissextile day."

The "Saturnalia" of Macrobius corroborates the record. It says, "Julius Caesar added 10 days to the former number in order to complete the 365 days which the sun takes to pass through the zodiac; and to take account of the quarter of a day, he directed the pontiffs, who were intrusted with the months and days, to intercalate one day every four years in the same month and in the same place the ancients had intercalated, that is, before the last five days of February, hence called bissextile."

The Julian calendar, started in 46 B. C., was to endure for 16 cen-

turies. In its first years, the calendar was not correctly followed as to its leap year rule. Caesar had been assassinated and thus his keen intellect was not available as a guide during the infancy of the new calendar. The pontiffs made every third year instead of every fourth, a Leap Year. This very likely was due to the Roman custom of counting both the first and last years in determining the Leap Year. Whatever its cause, it continued until twelve Leap Years had been observed instead of nine.

This error was corrected by Augustus, who followed Julius Caesar. Macrobius tells that Augustus had the correct Leap Year rule engraved on a table of brass to insure its continued correct observance.

Even though the Julian calendar represented a great improvement over the moon calendar which the Romans had been using, it was proved faulty after a few hundred years of use. With Julius Caesar's rule of one Leap Year in every four, the official calendar year was eleven minutes longer than the seasonal year. It was observed that the date of the spring equinox was slowly moving back from its original place of March 25th.

Although but a few hundred years were enough to show that the civil calendar was not keeping step accurately enough with the astronomical calendar, a change was slow in coming. Faulty reckoning continued for fifteen centuries during which time a change was often proposed but never effected. Religious tradition as well as lack of agreement as to the form of the change held it back. Rulers joined with the clergy in a century of discussion preceding the correction finally made by Pope Gregory XIII.

In 1582, Pope Gregory issued his Papal Bull in which Caesar's Leap Year rule was changed so that after the year 1600, the leap days of three centurial years in every four would be omitted. That is, in every period of four hundred years three Leap Years would be kept as common ones. He also corrected the existing error by making Oct. 5, 1582, the 15th.

Now the entire civilized world is reckoning time according to the Leap Year rule laid down by Gregory in his Papal Bull. Our civil year keeps step very well with the astronomical seasons but there still remains some error in the calendar, an error which continues to accumulate. This error amounts to 37.3 minutes in every one hundred years which is equivalent to .373 minutes a year, or one day in 3861 years. Dates can be kept in their proper places until 4000 under the present Gregorian system.

Eventually some change will have to be made in Leap Year rules in order to even further reduce the calendar's error. In a pamphlet by the United States Bureau of Education, a simple correction is suggested: "The year 4000 by Pope Gregory's rule should be a leap year. If it is kept a common year and if all those years the numbers of which can be divided by 4000 are kept as common years, our calendar will keep so well in step with the traveling of the earth around the sun that no date will move more than one day from its proper place for 20,000 years."

EDUCATIONAL CONSIDERATIONS

By Hilda Sidney Gruenberg

Swarthmore College

SOME time ago the Dean of a College was heard to say, "If, when they promoted me from Head of the English Department to Dean of Men, I had known that my mind would be occupied with football schedules, falling plaster in the dormitories, dates for holidays, and complaints about the food, I would never have accepted the promotion."

It is true, of course, that any man in an executive position must concern himself to some extent with trivialities. It is one of his duties to see that the purely mechanical functioning of his institution—whether it be a clothes pin factory, or a moving picture studio, or a hall of learning—be as smooth as possible. It is true, furthermore, that most of this work, the making of schedules, the hiring of the handy man to fix the plaster, the firing of the chef, is done by people who are subordinate to the Dean. They actually bother him with it only when the gaps in the ceiling are particularly large, the dates in the calendar particularly stubborn, the indigestion particularly acute. The rest of the time he gives his orders and then checks over the work when it is done. But whoever does the tedious work, it takes time and effort and worry. A certain amount is inevitable, but any suggestion for reducing it to a considerable extent would be more than welcome.

A large amount of the mechanical arrangements for the running of an educational institution in any one year is necessarily dependent on certain important dates and the days of the week on which they fall. Some years things work out beautifully, so that the Christmas and Easter vacations fall naturally within the one or two weeks allotted to these festivities, and the one-day holidays drape themselves gracefully around the week-ends and fall on either a Friday or a Monday. More often, however, the major holidays come at such a time that they cut into the week. The vacations have to be longer or shorter than is desirable, and the one-day holidays come on a Tuesday or a Wednesday or a Thursday.

The inmates of Deans' offices seem to get as many headaches over the task of arranging examination schedules as they do over the vacation schedules. In a way it is even worse because many of them are determined to be fair to the students and work out a system whereby the Juniors won't have a tremendous advantage over the Freshman, or the Engineering students won't feel that the Greek majors are getting a better break.

Besides the inevitable yearly occurrence of Election Day and French examinations, the so-called "extra-curricular activities" are increasingly taking their place as a vital and significant part of college and university

life. They give rise to a whole new set of schedules to be worked out within the framework of the academic year. The Sophomore Show, the monthly meetings of the Philosophical Society, the Tennis Tournament all have to be placed on days that are most advantageous to the group of people participating and, at the same time, will interfere least with other activities.

No one, however much of a fanatic he may be on the subject of calendar reform, would claim that these problems would disperse into thin air on the day that The World Calendar is universally accepted. He *would* maintain, however, that they could be most intelligently, most efficiently solved if they could be considered *one* year for *all* years. It would be worth while to make a college or university calendar to meet the aforementioned demands, if one knew that the same performance would not have to be repeated the next year and the next year and the next. The powers that be would be glad to give their attention to these issues—trifling in the singular, but gigantic when one realizes that all of them together determine the year's harvest. They would not be tempted to say that it doesn't make much difference one way or the other, because this is a particularly awkward year and so they might as well have a makeshift arrangement and hope that next year will be better. They would realize that *this* year is *every* year and that if a suitable calendar is devised, it will serve for all time.

Let it not be thought that only the workers behind the scenes would gain by the adoption of a stable and carefully planned academic year. All those directly or indirectly connected with the ever increasing and ever growing educational institutions would benefit. The students themselves would get most out of their college years if the extra-curricular activities were so planned as to interfere least with class hours. Then, too, if all middle-of-the-week holidays were eliminated or changed, teachers agree that this would have a decidedly beneficial effect on class work. Professors, as well as students, are more restless and less attentive on the days preceding and following one-day holidays. Three day week-ends, on the other hand, tend to send students and teachers back to work, refreshed and ready for mental exercise.

With the increased adoption of the seminar system, we find another demand on our calendar, a demand that it be stable and that the quarters be of equal length. Many colleges (notably Harvard, Dartmouth, and Swarthmore), as well as the graduate divisions of all the large universities, have substituted long weekly seminars in two subjects for short daily classes in four or five subjects. These changes affect from 25 to 90% of the students in the various institutions. This means, of course, that each meeting of the group is increased in its importance three to five-fold, and that missing one seminar is equivalent to missing three to five ordinary classes. Sometimes students have had to come back from their vacations a

day or two early in order to get in an additional seminar that would otherwise be skipped because of the way the dates fell on a particular year.

Sometimes they have squeezed one in on a Sunday night, or shifted Tuesday's seminar to Wednesday because of a holiday, thus leaving only one day between it and the other seminar for the week which would probably come on Friday. It doesn't matter, of course, when a particular seminar comes, but it *does* matter whether or not there has been adequate time for preparation. Many students and professors agree that a "squeezed in" seminar is worth practically nothing at all. Quarters of equal length, a calendar that is the same every year, would enable the administration to plan for the desired number of seminars and to space them better.

Another movement that has become popular in education is the plan for combining academic studies with experience in the world of business or the professions. This plan was originated at the University of Cincinnati and has been adopted with conspicuous success at Antioch College. The course takes six years instead of the usual four, but half of the student's time is spent in working at some job in the line he hopes to follow after graduation. The student body is divided into two groups, and each student in Group A shares his job with a co-worker in Group B who works on the job when it is student A's turn to study. This plan has many obvious advantages for students of certain types and for those of limited financial resources and for those interested in certain kinds of businesses or professions. But it is equally obvious that making out the program for an arrangement of this sort entails overcoming many obstacles, of which an irregular, shifting calendar is the greatest. The plan is satisfactory only if it can be so worked out that the students in Group A have exactly as many studying days, working days, and holidays as the students in Group B. Again, it would be worth while for the executives of such an institution to expend a considerable amount of mental energy in devising such a program, *if* they knew that it was to be followed in every succeeding year.

Lastly, it would be definitely advantageous to have all the universities and colleges cooperate in determining the calendar for the school year. This certainly does not mean that the Freshman Hop or Le Cercle Francais should be held on the same night every year the country over. Each college could arrange its activities to meet the needs of its own organizations, its own students and professors. It is the general frame of the academic year that should be adopted by all the universities to their mutual advantage. This means, for the most part, the opening and closing dates, vacation and holiday dates. In many families where the children go to different colleges, their vacations overlap by a few days only and sometimes (this year's Easter vacation is a case in point) they haven't even one day together. This may not seem to be of vital importance to the reader who plays an important role in business matters or affairs of state. But I am sure that anyone who stops to consider that in many families vacation time is the only chance they have for a complete reunion, will realize what it would mean to thousands of families the country over to have standard vacation times. And leaving sentiment out of it altogether, the educators would benefit, for it is during vacations that national conferences are held. Having the opportunity to meet and exchange ideas with people who are working on projects in similar or related fields, is not only pleasant and stimulating to individuals, but of benefit to education in general.

CHANGES IN TIME

By HERBERT B. NICHOLS

Natural Science Editor of the Christian Science Monitor

CHICAGO seceded from the Middle West a short time ago. By advancing her clocks one hour the Windy City became an island of eastern time in a sea of central standard time.

Modern methods of transportation and communication are held responsible. Fast express planes leaving Chicago can land in New York five hours later by the clock, and the radio brings both cities as near together as the Cohens and the Kellys across a tenement court.

It's the same old story of half a century ago, only today it appears in more modern garb. When it took a month for messages to cross the Atlantic one way, and the Middle West was at least two weeks from "the big city" by pony express, differences of an hour or two in time bothered no one. Then came steam carriages and messages by telegraph.

Despite vehement objections to "meddling with the Lord's time," 1883 saw four standard time zones adopted in the United States, and the arrangement quickly spread to Europe and the Far East. Previously, every city and town set its own clock by the sun and scarcely two agreed.

Meanwhile, the railroads, though prime movers in the adoption of the zones, did not legalize their use until 1918, when Congress delegated to the Interstate Commerce Commission power to regulate railway time scales. Even the zones themselves are not clear-cut boundaries, running straight up and down like meridians, but zigzag hither and yon, influenced largely by the location of railroad division points.

But Chicago is more than an oasis of eastern time in the broad central belt. She stands as the symbol of scientific and commercial controversy which portends changes not only in existing time scales as they pertain to the world's clocks, but in the calendar as well.

At the last meeting of the American Association for the Advancement of Science in St. Louis, time scale changes was one of the dynamite-loaded subjects introduced for discussion in the astronomy section.

Bemrose Boyd, University of Iowa delegate to the meeting, pointed out that, at the latitude of New York, one hour of time corresponds to about 784 miles of earth's surface, which is just a whip, whir and whiz for transport planes. He also drew attention to the intricacies of deciphering the present muddle of world radio timetables. Divisions into two, three and six-hour time zones were discussed for the United States.

Elliot Smith's proposal, advanced in 1918, that the nation adopt ninetieth-meridian time, the actual sun time of the Mississippi River roughly speaking, received much favorable comment. According to this plan, the

clocks of the entire continent would read the same hour and everyone would have "North American time." Chicago, however, is the first to originate a radical change.

The attack on the calendar, which is likewise a matter of accurate time computation, is an even older problem—one which was hoary when Cheops built the Pyramids of Gizeh. The year is determined by astronomical observations of the time it takes the earth to make a complete trip around the sun, and the length of a day is the time it takes the earth to make a complete turn on its axis.

Unfortunately, it happens that the number of days it takes the earth to complete its orbit and the number of hours required for a spin on its axis do not come out in even numbers. One thinks of the year as 365 days and the day as twenty-four hours, but actually the year is exactly 365 days 6 hours 9 minutes 9.6 seconds, and the day is 23 hours 56 minutes long.

In February of most Leap Years an extra day is added to the calendar to keep it in step as much as possible with nature, but even this does not suffice. The calendar year is still twenty-four seconds longer than it should be to be absolutely correct.

The modern calendar is an outgrowth of changes made in the existing calendar of 47 B. C., at which time it became evident that, unless corrections were applied, Roman farmers would be harvesting their crops in the spring, and winter would change places with summer. Julius Caesar ordered a calendar then which lasted without change for 16 centuries.

Then in 1582, Pope Gregory revised it in such a way as to match more closely the motion of the moon and at the same time the orbital journey around the sun. Oct. 5, 1582, became Oct. 15—and the Gregorian calendar under which we live today came into effect.

"But why change the calendar when the errors are apparently of academical importance only?" someone is sure to ask.

That's just it, the reform of the calendar has left the category of academic discussion, for it affects the life of every individual.

Business in particular demands uniformity in the calendar. Charges of inconvenience, irregularity and cost are hurled in its direction. Every year is different and no one can tell, except by referring to astronomical textbooks, how the days of the month ran in connection with weekdays four or five years back. Employees paid by the month find one with 28 or 29 days, four with 30 and seven with 31. The quarters of the year have 90, 91, or 92 days, and the first half-year has either 181 or 182 days, while the last half has 184.

The orthodox church runs into difficulty trying to figure out the vacillations of Easter Sunday. School and college calendars have similar troubles with Spring and Christmas recesses. The exodus of the spring tourist and the advent of Labor Day are factors which vitally influence the hotel busi-

ness, transportation companies, resorts and automobile service stations.

Instability of the Easter date makes it difficult for stores to synchronize trade and business requirements. At this season, department stores, clothing stores, florists, and all textile and hat industries throughout the world reach a peak in trade. If Easter is early, trade suffers because people continue to wear winter clothing until warmer weather comes, while if it is too late, the public decides not to invest in spring commodities.

Similar stories are told in other lines, in the courts, in legislation and in government. Irregularities crop up in finance, accounting, shipping, banking, insurance, labor, production, investment, real estate and so on ad infinitum—until 44 nations of the world have decided to take active part in the League's attempt to straighten things out.

Though more than 500 different plans for changing the calendar have been put forth in recent years the choice narrows down to either The World Calendar or the 13-month calendar.

After all, the calendar is merely a mechanical device the world has found handy for carrying on its daily business. It can scarcely be called sacred, even though the church as well as state uses it for recording events. Julius Caesar saw fit to appropriate a day from February to give his own month of "July" 31, and Augustus Caesar likewise stole from February to fatten his namesake, "August," so why should the powers in 1936 hesitate to change things around for the sake of convenience rather than selfish pride?

OBITUARY NOTES

THE Right Reverend Elmer Nicholas Schmuck, Bishop of Wyoming, died on April 28th at the age of 53. Bishop Schmuck was instrumental in gaining endorsement for The World Calendar by the Episcopal Church and advocated a national convention of authorized representatives appointed by all the churches to endorse the 12-month plan and urge its adoption on the governments of the world.

MR. J. HAROLD DOLLAR, first vice-president of the Dollar Steamship Company, founded by his father, the late Robert Dollar, died in San Francisco on April 7th. He had long been interested in the calendar reform movement.

DR. W. F. BADE, discoverer of Mizpah in Palestine, died on March 4th. An expert on Semitic language and an authority on the Old Testament, Dr. Bade was Professor of Semitic Languages and Comparative Literature at the Pacific School of Religion at Berkeley, California. He was one of the earliest members of The World Calendar Association. His membership dates from July, 1931.

OTHER deaths among the membership of The World Calendar Association during the past few months included: Orra E. Monnette, vice-president of the Bank of America; William J. Bogan, Superintendent of Schools in Chicago; Professor Rasmus Bjorn Anderson, director of the Scandinavian Department of the University of Wisconsin; Dr. John Hope, president of Atlanta University; Mrs. Arthur Hutchinson, associate professor of economics at Vassar College; Francis Sparacino, editor and publisher of The Nassau Daily News; and Captain Marcus H. Tracy, a prominent figure in New York shipping circles.

LABOR SPEAKS AT GENEVA

MOST important among the international conferences of the summer was the meeting of official delegates to the International Labor Office at Geneva, in June. Calendar reform came prominently before this gathering of government delegates from the great powers. After discussion in the committee on resolutions, a formal motion urging revision of the calendar was brought before a plenary session on June 24, and was passed unanimously. Text of the resolution was as follows:

Considering that the Eleventh Session of the International Labor Conference, held in Geneva in June, 1928, passed a resolution in favor of calendar reform, drawing attention to the interest which this question has for the workers on account of its relation with the rationalization of work and labor statistics and the regularization of public holidays;

Considering that the Secretariat of the League of Nations has asked the International Labor Office to communicate to it periodically any information which it can obtain concerning the attitude to this question of the workers;

Considering that it is a well-recognized fact that the present calendar is very unsatisfactory from economic, social and religious standpoints, and that recent studies, investigations and reports have shown that there is a marked trend of opinion in favor of its revision;

Considering that the resolution concerning calendar reform adopted by the Labor Conference of American States which are members of the International Labor Organization, at its session held at Santiago in January, 1936, recommends the adoption of the perpetual calendar of 12 months and equal quarters;

The International Labor Conference at its Twentieth Session requests the Governing Body of the International Labor Office to call the attention of the Council of the League of Nations to the question of calendar reform and to ask it to recommend the Committee on Communications and Transit of the League of Nations to continue to study the whole of this question very closely at its meeting in 1936; and

Requests that copies of this resolution should be communicated to the Secretary-General of the League of Nations and to the States Members and non-Members of the International Labor Organization.

Addresses introducing the resolution were made by Garcia Oldini, delegate of Chile and chairman of the Committee on Resolutions; Gajardo Villarroel, of Chile; and Senator Corneille Mertens, of Belgium, vice chairman, of the Governing Body of the International Labor Office and president of the workers' delegates.

WEEKLY BUSINESS PERIODS

By H. W. Bearce

U. S. Bureau of Standards

(Publication Approved by the Director of the Bureau of Standards of the U. S. Department of Commerce)

DISCUSSIONS and addresses held under the auspices of the American Statistical Association have clearly brought out a fact that is often overlooked—namely, that a sharp distinction should be made between the adoption of a weekly, bi-weekly, or 4-weekly business period for statistical purposes and revision of the civil calendar. The necessity for this distinction is clearly evidenced by the fact that there is now in use a wide variety of weekly business and accounting periods without any reference to revision of our civil calendar. It cannot, therefore, properly be held that revision of our civil calendar on a 4-weekly, 13-monthly, or any other basis, is a necessary prerequisite or accompaniment to the use of weekly periods for statistical purposes.

On the other hand, it can readily be shown that revision of our calendar in such a way as to make it perpetual would make the use of weekly, bi-weekly and 4-weekly periods much more convenient for statistical purposes than is the case under our present calendar.

What is meant by a "perpetual" calendar is, of course, a calendar in which January 1 always falls on the same day of the week. Under a perpetual calendar there would be no "cycling" of January 1 or any other given date, through the various days of the week. That is, any given date of any given month would always fall on the same day of the week.

The average length of our calendar year, under the Gregorian leap-year rule, is 365.2425 days, while the length of the tropical, or solar year, according to Newcomb's equation, is 365.2422 days. This difference, amounting to one day in 3300 years, can if desired be corrected by a slight modification of the leap-year rule.

If we wish to adhere to our present leap-year rule and at the same time set up a perpetual calendar, all that is necessary is so to divide the calendar year that the 365.2425 days will be included in a whole number of complete weeks, with no remainder. Since 52 7-day weeks will account for 364 days, it is seen that the annual excess of 1.2425 days must, in some way, be included in the 52 weeks, if we are to have a perpetual calendar.

It would, of course, be extremely inconvenient and confusing to have a fractional part of a day included in any calendar year. Fractional days are avoided by making some years contain 365 and others (leap years), 366 days. By a proper distribution of ordinary years and leap-years, as for example, under the Gregorian leap-year rule, the calendar year and

the solar year are kept sufficiently close to the same length to prevent a wandering of the seasons through the calendar year.

We have, therefore, in each ordinary year one day in excess of 52 weeks, and in each leap-year two days in excess of 52 weeks. What to do with these extra days is the problem which must be solved if we are to retain the 7-day week and at the same time have a perpetual calendar.

It will be noted that up to this point the question has been how to obtain a perpetual calendar, which all agree is desirable. From this point on, the question will be how best to subdivide the 52-week perpetual calendar in order that it may attain a maximum of convenience and usefulness. On this point there is a wide diversity of opinion.

The most natural procedure would be to divide the 52-week year into halves of 26 weeks each, and quarters of 13 weeks, or 91 days, each. Each quarter may also be subdivided into months; but the months cannot be equal, and each month cannot contain a whole number of complete weeks. The best that can be done under this method of subdividing the quarters is to have in each quarter one month of 31 days and two months of 30 days each. Such a calendar would differ but little from our present Gregorian calendar. Its principal advantages would be: (a) that the calendar would be perpetual; (b) that its quarters would be equal; (c) that each month would have 26 week-days; (d) that corresponding periods in successive years would be comparable; (e) that 12 is divisible in various ways.

The disadvantages of this plan are: (a) that its months would not be exactly equal, and (b) that each month would not contain a whole number of complete weeks.

An alternative method of subdividing the 52-week calendar year would be to divide it into 13 periods of 4 weeks, or 28 days, each.

The advantages of this plan would be: (a) that the calendar would be perpetual; (b) that its "months," or 4-week periods, would be equal; (c) that each period would contain a whole number of complete weeks, and (d) that corresponding periods in successive years would be comparable.

The disadvantages of this plan are: (a) that it would be a wide departure from our present calendar; (b) that 13 not being evenly divisible into halves and quarters, the end of the first, second and third quarters would not coincide with the end of a month; (c) that the 28-day periods would not be comparable in length with our present months (except February); (d) that these 4-week periods would be displaced by varying and excessive amounts from the present months; (e) all dates above 28 would have to be dropped, and (f) a new month would have to be added to the calendar.

There is wide diversity of practice among those who are using weekly business periods under our present calendar. This diversity arises largely as a result of differences in the method of taking into account the extra 1 day or 2 days of each year in excess of 52 weeks. Some include the extra day or days in the last week of the year; others allow the extra days to accumulate for 5 or 6 years and then put in an extra week at some point in the calendar year; some put this extra week at one point in the calendar and others at other points. The result of this diversity of practice is that production, sales, and other figures based on periods of varying length and arrangement are far from comparable.

This diversity of practice in the use of business periods based on the week and multiples of the week would be largely overcome by the adoption

COMPARISON OF 1-WEEK, 2-WEEK, AND 4-WEEK ACCOUNTING PERIODS

Under the 12-month equal-quarters plan, and the 13 equal-months plan of calendar revision

Perpetual Calendar Plan	1st Week	2nd Week	3rd Week	4th Week
12-month	Jan. 1—Jan. 7	Jan. 8—Jan. 14	Jan. 15—Jan. 21	Jan. 22—Jan. 28
13-month	Jan. 1—Jan. 7	Jan. 8—Jan. 14	Jan. 15—Jan. 21	Jan. 22—Jan. 28

Calendar Plan	5th Week	6th Week	7th Week	8th Week
12-month	Jan. 29—Feb. 4	Feb. 5—Feb. 11	Feb. 12—Feb. 18	Feb. 19—Feb. 25
13-month	Feb. 1—Feb. 7	Feb. 8—Feb. 14	Feb. 15—Feb. 21	Feb. 22—Feb. 28

Calendar Plan	9th Week	10th Week	11th Week	12th Week
12-month	Feb. 26—Mar. 2	Mar. 3—Mar. 9	Mar. 10—Mar. 16	Mar. 17—Mar. 23
13-month	Mar. 1—Mar. 7	Mar. 8—Mar. 14	Mar. 15—Mar. 21	Mar. 22—Mar. 28
	End 1st Quarter	Begin 2nd Quarter		
Calendar Plan	13th Week	14th Week	15th Week	16th Week
12-month	Mar. 24—Mar. 30	Apr. 1—Apr. 7	Apr. 8—Apr. 14	Apr. 15—Apr. 21
13-month	Apr. 1—Apr. 7	Apr. 8—Apr. 14	Apr. 15—Apr. 21	Apr. 22—Apr. 28

Calendar Plan	17th Week	18th Week	19th Week	20th Week
12-month	Apr. 22—Apr. 28	Apr. 29—May 4	May 5—May 11	May 12—May 18
13-month	May 1—May 7	May 8—May 14	May 15—May 21	May 22—May 28

Calendar Plan	21st Week	22nd Week	23rd Week	24th Week
12-month	May 19—May 25	May 26—June 2	June 3—June 9	June 10—June 16
13-month	June 1—June 7	June 8—June 14	June 15—June 21	June 22—June 28*
		End 2nd Quarter	Begin 3rd Quarter	
Calendar Plan	25th Week	26th Week	27th Week	28th Week
12-month	June 17—June 23	June 24—June 30*	July 1—July 7	July 8—July 14
13-month	Sol 1—Sol 7	Sol 8—Sol 14	Sol 15—Sol 21	Sol 22—Sol 28

Calendar Plan	29th Week	30th Week	31st Week	32nd Week
12-month	July 15—July 21	July 22—July 28	July 29—Aug. 4	Aug. 5—Aug. 11
13-month	July 1—July 7	July 8—July 14	July 15—July 21	July 22—July 28

Calendar Plan	33rd Week	34th Week	35th Week	36th Week
12-month	Aug. 12—Aug. 18	Aug. 19—Aug. 25	Aug. 26—Sept. 2	Sept. 3—Sept. 9
13-month	Aug. 1—Aug. 7	Aug. 8—Aug. 14	Aug. 15—Aug. 21	Aug. 22—Aug. 28
			End 3rd Quarter	Begin 4th Quarter
Calendar Plan	37th Week	38th Week	39th Week	40th Week
12-month	Sept. 10—Sept. 16	Sept. 17—Sept. 23	Sept. 24—Sept. 30	Oct. 1—Oct. 7
13-month	Sept. 1—Sept. 7	Sept. 8—Sept. 14	Sept. 15—Sept. 21	Sept. 22—Sept. 28

Calendar Plan	41st Week	42nd Week	43rd Week	44th Week
12-month	Oct. 8—Oct. 14	Oct. 15—Oct. 21	Oct. 22—Oct. 28	Oct. 29—Nov. 4
13-month	Oct. 1—Oct. 7	Oct. 8—Oct. 14	Oct. 15—Oct. 21	Oct. 22—Oct. 28

Calendar Plan	45th Week	46th Week	47th Week	48th Week
12-month	Nov. 5—Nov. 11	Nov. 12—Nov. 18	Nov. 19—Nov. 25	Nov. 26—Dec. 2
13-month	Nov. 1—Nov. 7	Nov. 8—Nov. 14	Nov. 15—Nov. 21	Nov. 22—Nov. 28
				End 4th Quarter
Calendar Plan	49th Week	50th Week	51st Week	52nd Week
12-month	Dec. 3—Dec. 9	Dec. 10—Dec. 16	Dec. 17—Dec. 23	Dec. 24—Dec. 30**
13-month	Dec. 1—Dec. 7	Dec. 8—Dec. 14	Dec. 15—Dec. 21	Dec. 22—Dec. 28**

* Followed each leap-year by "Leap-year Day," June L or June 31, (June 29 under the 13-month plan), a 24-hour holiday period and an extra Saturday.

** Followed each year by "Year-end Day," December Y or December 31, (December 29 under the 13-month plan), a 24-hour holiday period and an extra Saturday.

of a perpetual calendar on either the 12-month or the 13-month plan. A business period expressed in weeks is practicable under either plan.

There is a tendency on the part of some advocates of the 13-month calendar to place on the 12-month calendar all blame for the irregularities that now occur in the use of weekly business periods, and to claim that these irregularities would be overcome by adoption of a 13-month plan.

For example, L. J. Stewart, Comptroller of the Western Clock Co., in a paper first presented in 1928, makes the following statement: "We may truthfully ascribe all our calendar irregularities to the use of the 12-month calendar."

Careful reading of Mr. Stewart's paper will show that statement to be not justified. The type of irregularities that Mr. Stewart is discussing throughout his paper arises not from the fact that our calendar is a 12-month calendar but from the fact that it is not a perpetual calendar; that is, that in each year there is a period of 1 day, or 2 days, in excess of 52 weeks.

These irregularities will be overcome, not by adopting a 13-month calendar, but by adopting a perpetual calendar.

Having first adopted a perpetual calendar of 52 weeks we can then divide the 52 weeks into either a 12-month, or a 13-month calendar. In either case 13 equal 4-week periods would make up a complete calendar year; and corresponding 4-week periods would be comparable for all years. There is no necessity whatever of giving to these 4-week periods the names of months.

The 4-week periods, Jan. 1 to Jan. 28, Jan. 29 to Feb. 25, Feb. 26 to March 23, March 24 to April 21, etc., would be just as definite and just as comparable as though we designated the same periods as Jan. 1 to Jan. 28, Feb. 1 to Feb. 28, March 1 to March 28, April 1 to April 28, etc.

The principal difference between the two plans is that under the 12-month equal-quarters perpetual calendar, anyone who wished to do so could use 4-week periods for business and statistical purposes, and could continue to use the regular months and quarters for all other purposes; whereas, under the 13-month plan, everyone would be obliged to use the 4-week periods for all purposes.

If it is admitted that business periods expressed in weeks can be used as conveniently under a 12-month equal-quarters perpetual calendar, as under a 13 equal-months perpetual calendar, then the argument in favor of a 13-month calendar no longer exists.

If the use of a business period based on the week is as desirable and as convenient as its advocates believe it to be, even under our present calendar, would it not be good strategy for all who favor calendar revision to unite their efforts toward the adoption of a perpetual 12-month equal-quarters calendar without sacrificing the practical 12 months and the equal-quarter and half-divisions? It is also obvious that a greater scope ot application exists in this plan.

It may well be that the perpetual 12-month equal-quarters calendar will be found so satisfactory for business, statistical, and all other purposes, that even the advocates of the 13-month plan will be entirely satisfied without further change.

ROMANCE OF THE CALENDAR

By P. W. Wilson

CHAPTER V: DEMAND FOR MEASUREMENT

SINCE the dawn of history, the world has been, as it is today, accustomed to the conception of measurement. That conception has included length, volume and weight. The Greeks had a furlong of 606 feet 9 inches to which they applied a name, stadion—Latin stadium—that is in use to this day. The Romans had a passus or pace of 4 feet 10.248 inches, the use of which word also survives. The Hebrews had the cubit, or length of forearm, equal to 19 inches, out of which arose the saying that nobody by taking thought can add a cubit to his stature. The Persians had a parasang—so often mentioned by Zenophon—of about 3½ miles. Also there were currencies—the Hebrew shekel, the Roman libra (Italian lira), and denarius, which are recalled in the "L" and "d" of L.s.d.

If we consult books of reference, we learn in a few minutes about the astonishing multiplicity of weights, measures and currencies which, at this moment, are used by man in various regions of the world. The farsang of Abyssinia, the quo of Annam, the tarri of Algeria, hundreds of such unfamiliar names—overwhelm the imagination.

There have been many reformers of traditional weights, measures and currencies. Why—they ask—should children have to waste time at school, learning to transpose a given length, area, weight or sum of money from one scale of reckoning to another? Why should the necessity of such transposition complicate the conduct of commerce? Is it not absurb, that there should be 12 inches to the foot and 3 feet to the yard and 1760 yards to the mile and a different mile for the landsman and the seaman? Is it not ridiculous that 272¼ square feet should equal a square rod and that 160 square rods should equal an acre? Why should gold, silver and precious stones be appraised by Troy weight according to which 24 grains equal a pennyweight, and 20 pennyweights equal an ounce? Why should mariners have to remember that 7½ cable lengths equal a mile and why should this nautical mile, supposed to be 1/60th of a degree at the Equator differ for Great Britain, the United States and France? Why should 21½ quires of paper equal a printer's ream? And so with currencies. Why should four farthings make a penny and twelve pennies make a shilling and twenty shillings make a pound? Why should the value of the Indian rupee be a mysterious uncertainty on which economists themselves have to wrinkle their experienced brows?

Hence there has been devised and secured the wide adoption of a plan which is as masterly as it is simple and comprehensive. Are there not ten fingers and thumbs on our two hands and do not children count things on

their fingers? Why not express units of calculation in tens and multiples of ten—hundreds, thousands, millions—billions, trillions? And so with currency. Let there be 100 centimes to the franc, 100 cents to the dollar.

It was Jean Picard (1620-1682) who put forward the idea of using some natural standard of length as the basis of the decimal system. His publication was entitled *La Connaissance des Temps* and it was his idea that the swing of a pendulum in one second should furnish the unit of length. Out of Picard's initiative emerged what is called the metric system—named after the Greek word metron—which was established by revolutionary France—but only after prolonged calculation—in 1799. The fundamental unit is the metre representing one-ten millionth part of a quadrant of the earth through Paris. The unit of volume is a litre representing a cube with one-tenth of a metre for its edge. The unit of weight is a gram representing one-thousandth of a litre of water at a temperature of 4 degrees centigrade.

The metric system is thus the last word in Gallic logic. To the scientist and the statistician especially, its simplicities are invaluable. The acceptance of the Gregorian Calendar itself has been hardly more remarkable than the adoption of this far-reaching standardization of weights, and measures, whether associated or not with currencies. It is obligatory in Argentina, Austria, Hungary, Belgium, Brazil, Chile, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Peru, Portugal, Rumania, Yugo-Slavia, Spain, Sweden, Switzerland. Its use is legalized in Egypt, Britain, Japan, Russia, Turkey and the United States.

It will be noticed that nations regarded as rival—France and Germany —Italy and Yugo-Slavia—Russia and Japan—Chile and Peru—have no quarrel with what they know to be valuable as a standard of measurement. In a great human utility, there is found to be a denominator common to all races, religions and sovereignties.

We may ask why it is not possible to apply a decimal system to the calendar. There are exact multiples of length, volume and weight. Why cannot the calendar be thus neatly coordinated?

The clock that tells the time of day is a marvellous mechanism. But it is made by man. It can be changed by man. It can be broken by man. It can be mended by man. But the clock that tells the days, the months and the years is a celestial clock, created without man's assistance and maintained wholly beyond man's control. Not by the split of a second can man modify the music of the spheres. The celestial timepiece is a magnificent panorama of immutability.

Scientists who are competent to speak with authority on astro-physics seem to be in no doubt as to the origin, two thousand millions of years ago or thereabouts, of the solar system. There were two stars that passed one another at incredible speeds, mutually attracting their flaming vapors as

the sun and moon attract the tides of the ocean, and scattering fragments of fire, some of which, as the stars separated, went on whirling around the sun. The comets are nebulae that, as they sweep along their orbits, continue like torches to burn their way through space. The planets and their moons have solidified. Also there are specks of planetary dust that are sometimes caught by our atmosphere through which they penetrate at such speed that they are again rubbed by friction into flame. These are the shooting stars that occasionally reach the earth as meteorites. The solar system—antedating by billions of years the arrival of man—is a stupendous expression of titanic forces operating on matter, which have been gradually subjected to the reign of a divine law of orderly motion.

The early makers of the calendar had not arrived at any such conception of the universe above their heads. They had no means of knowing one resultant fact which to us is axiomatic. Celestial motions, thus attributable to shattering explosions and collisions in the heavens, must be chronologically independent. The spin of the earth on its axis is but slightly influenced by the rotation of the earth. And so with the rotation of the moon; it is but slightly influenced by the spin and rotation of the earth. It follows that there never has been and never will be an exact number of days in any lunar month or in any solar year, nor in the solar year is there any exact number of lunar months. At every point in their progress, makers of the calendar have thus had to deal, not merely with numerals, but with fractions which had to be incorporated into the almanac.

There is no difficulty in taking one astronomical unit—the day—and subdividing it into hours, minutes and seconds. Also, we can multiply the day into a week, so arriving at an exact table as follows:

60 seconds .....one minute
60 minutes .....one hour
24 hours .....one day
7 days .....one week

Nor would there be any difficulty, arithmetically, in changing this schedule—taking subdivisions at random—as follows:

80 seconds .....one minute
70 minutes .....one hour
30 hours .....one day
10 days .....one week

With the day as basis, it would thus be possible, theoretically, to ordain a decimal system for time, similar to the decimal system for weights, measures and coinage—in which case there would be 100 seconds to the minute, 100 minutes to the hour, ten hours to the day and ten days to the week. All of this is possible because we would be basing the entire structure of such measurement upon a simple astronomical unit—the day.

If, however, we tried to extend a decimal or any other such exactly

multiple calendar from a day to a month or a year, we would find at once that we had divorced the measurement of time from man's most familiar experiences—the lengths of light and darkness in the day, the tides, the appearance of the sky above his head, the seasons that are observed by the very soil under his feet, the habits of birds and beasts and fishes. The man who tried to use a decimal calendar would be more of an exile than a man without a country. He would be a man without a universe.

The development of the calendar as we know it today has been an age-long struggle for simplification of astronomical fractions. From the innumerable complications of the celestial mechanism, man has had to select the hands of his clock and, when selected, to adjust their relations.

The comets were of little value for this purpose. It was not until 1682 that Edmund Halley, the friend of Newton, observed the comet which is known by his name, calculated its orbit and predicted its return in 1757 after an interval of 75 years.

Attention—for instance, in pre-historic Mexico—was bestowed on the planets. But they were no more helpful than the comets. A year may be defined as the period within which a celestial body moves around the sun, and such "years" within the solar system are, approximately, as follows: Mercury, 88 days; Venus, 224¾ days; Earth, 365¼ days; Mars, 687 days; Jupiter, 4,332½ days; Saturn, 10,759 days; Uranus, 30,687 days; Neptune, 60,127 days.

Such planetary periods—varying from three months to 164 years—could hardly be regarded as convenient as standards of time.

The calendar has thus depended in the main on three celestial bodies—the sun, the moon and the earth itself. The rotation of the earth around the sun gives the year, the rotation of the moon around the earth gives the month, and the spin of the earth on its axis gives the day.

OUT OF CHAOS

by Joseph Guiney

Since first the vast machine began to move
  Each sun and planet in its charted site,
The Earthsphere spun in its appointed groove,
  The Hands that built it, blessed it with His Light.
So Time was measured by each rising sun
  Men scratched a cavern wall to mark each morn
And scholars planned a clumsy chart to run
  Unceasingly. The calendar was born!
Today our world creaks like an ancient van
  Archaic months encompass it so tight,
But hope eternal springs for errant man
  A new plan breathes and lives by woman's sight.
It guides our feet in even measured span
  And leads us from the darkness into LIGHT!

EXCERPTS AND REVIEWS

World Agreement

By WALTER F. WILLCOX

Professor of Economics at Cornell University, Vice-Pres., International Statistical Institute

(From an Address before the U. S. Government's Central Statistical Board.)

PUBLIC opinion — religious, scientific, technical and commercial—has moved rapidly since 1931 towards agreement on calendar reform of the 12-months, equal-quarter type.

The time has now come when the United States Government should propose the holding of an international congress on this subject, a meeting at which all nations and all interests should be fully represented, to consider what steps can be taken toward the enactment of a revised calendar.

American discussion of the whole question started fully ten years ago, with a campaign in favor of the 13-month year, led by George Eastman of Rochester. This phase of the discussion reached its peak about 1931, when 44 countries were represented at the calendar reform congress in Geneva. Two of the 44 countries definitely declared for the 13-month plan, and two voted with equal definiteness for the 12-month plan. The others were still non-committal.

Since 1931, however, much progress has been made. In the British House of Lords only three months ago, after a discussion in which Lord Desborough and the Archbishop of Canterbury advocated calendar reform, the government representative said: "If this matter were to be placed on the agenda of the forthcoming meeting of the League of Nations' Section on Communications and Transit, the whole question would have the most sympathetic consideration of the British representatives."

Germany seems to be equally favorable to calendar reform. Dr. Frick, Minister of Interior, said last June that his government was giving the subject much attention, although for the time being advocacy of the reform was being left to private and unofficial agencies. Many smaller powers, including all Latin-American countries, favor The World Calendar.

Of course, an important element in this matter is the position of various religious bodies. The Roman Catholic Church holds that there is no dogmatic objection to a revision, but Rome is opposed to any 13-month calendar. Speaking for Protestantism, the Archbishop of Canterbury said in the House of Lords: "I have found it impossible to resist the plea for reform in this matter." Religious authorities at the Lambeth Conference saw no difficulty in principle to a change in the calendar; the Greek or Eastern Orthodox Church is a leader in the movement for revision.

The attitude of science seems to be stated with sufficient clarity in resolutions adopted by the American Philosophical Society, the American Academy of Arts and Sciences and the American Association for the Advancement of Science.

From the business point of view, the International Chamber of Commerce, the United States Chamber of Commerce, the London Chamber of Commerce, the Association of British Chambers, and the Chamber of Commerce of the State of New York are on record.

Labor representatives have spoken clearly through the International Labor Office, and quite recently through the Santiago Conference of American States.

British Commerce Speaks

(Abstracted from the London newspapers)

GENERAL reform of the calendar is advocated by the Council of the London Chamber of Commerce, in a resolution which has been sent to the Prime Minister, the Secretary of State for Home Affairs, and to His Holiness the Pope. A similar resolution has been passed by the Association of British Chambers of Commerce, on motion of Lord Desborough.

The Chambers are convinced that the fixing of the date of Easter, which would confer great benefits on trade and commerce generally, can best be made effective as part of a general calendar reform.

Inefficiency of the present system, it is pointed out, is obvious when it is realized that the same quarters are not comparable for statistical purposes from year to year

owing to the varying number and arrangement of working days.

The Government, therefore, is urged to use its influence at the conference to be held in the autumn under the auspices of the League of Nations to secure the adoption of a perpetual 12-month calendar divided into equal quarters of 91 days, with an undated Year End Day and a fixed date for Easter.

The present oscillating dates for Easter and Whitsun, Lord Desborough says, cause great inconvenience. There is needed one fixed Easter date for the whole of Christendom. A good deal of progress has been made of late toward this objective. When the League of Nations committee met in 1931, many schemes were submitted for the reform of the calendar, but they have now been reduced to two. Last year a distinguished Roman Catholic placed before the Pope the reasons for the reform, and the Roman Catholic Church is now watching the movement with the greatest interest.

Lord Desborough will represent the Association of British Chambers of Commerce at Geneva when the matter is next considered there.

Easter History

By WILLIAM H. BARTON, JR.

Lecturer at the Hayden Planetarium

(From the Planetarium Bulletin, N. Y. C.)

IN our modern world there are many reasons why it would be convenient to have the date of Easter fixed. Great Britain has already voted for a date independent of the moon. By act of Parliament in 1928, England approves an Easter falling on the first Sunday after the second Saturday in April.

The World Calendar Association, advocating The World Calendar, would fix the date absolutely on April 8.

If this calendar is adopted in 1939, as the Association confidently hopes, the Gregorian date of April 9 will become April 8 and remain there for all time and in all parts of the world.

The name Easter is derived from the Anglo-Saxon Goddess of Spring, Eostre, and a month in spring corresponding to our April was called Eosturmonath. In a great many languages we find the word derived from the Hebrew name of the Passover festival, Pesach. The early Christians observed the Jewish festivals and the Passover became Easter to them. Their controversy over the date of Easter was finally settled at the Nicean Council called by Constantine in 325, and the rule now in use was adopted. Easter is the Sunday after the full moon that follows the Vernal Equinox. This brought uniformity to the observance, but still no good method of determining the paschal moon. The main difficulty lies in the fact that longitude enters the problem. The cycle now used involves the use of the Golden Number and Dominical Letter, mentioned in the almanacs and in the Book of Common Prayer. This artificial but ingenious method of finding the date of Easter was invented by Lilius.

From a Berlin Platform

By ERLAND ECHLIN

(Address at the University of Berlin)

CHANGES are going on all around us, in this modern world, that a few years ago would have been called impossible, perhaps even unnecessary. They indicate to us the adaptability of humanity, and the inevitability of evolution.

Another kind of a change, soon to materialize, is bigger in its field than any which we have seen, for the whole world will be affected by it. It is calendar reform.

Three years from now, in 1939, we shall probably find ourselves living under the new calendar. For the past century the growing agitation on the part of science, commerce and religion has developed until this change is approaching legislation.

In 24 of the world's leading nations, active committees and organizations are at work studying and publicizing the advantages of calendar reform. The League of Nations has long advocated it.

In a world torn by political disputations and the fear of war, the progress of this cause has passed without marked notice. Some statesmen still feel that "now is not the time" for it, but far more believe that calendar reform will prove an economic stabilizer with a tendency to promote international agreement, and that therefore now is the psychological moment to press for the adoption of the changes necessary to obtain these advantages.

CURRENT PRESS COMMENT

Change is Coming

Erie Times

The day is not far distant when all civilized countries will have a calendar which will meet the requirements of business men, schools and churches. But one thing is certain—it won't be a 13-month year.

Benefits Everybody

Lima (Peru) Cronica

South American countries are devoted partisans of calendar reform because it is a cause that benefits all. The proposed new calendar has many advantages. But not the fantastic 13-month plan. Rather the well-grounded proposal known as The World Calendar.

World Cooperation

Rio de Janeiro Correio da Manha

In the cooperative international effort on behalf of calendar reform, we see a salutary indication of world progress and goodwill. The exigencies of modern life demand this change in time measurement. The movement for it transcends national barriers.

Concerted Action

Wooster (O.) Record

The world is awakening to the necessity of an improved system of reckoning time. The proposed new calendar is simple in structure, easily understood, workable. Several countries have already definitely committed themselves, and concerted action is expected this year toward inaugurating the revision in 1939.

No More Opposition

Gainesville (Mo.) Times

Most of the opposition to calendar reform has vanished, and the question now is which plan shall be adopted. At present the 12-month equal-quarter proposal seems to be in the lead. Certainly something is going to happen in this matter.

Merits of Convenience

Jersey City Journal

Unquestionably the proposed World Calendar has many features to recommend it. And as it has been approved by business, science and the churches, with the League of Nations also behind it, there is strong probability of its adoption in 1939, when January 1 falls on Monday by the old calendar, in conformity with the proposed new one. It has all the merits of convenience.

United Support

Sheridan (Wyo.) Press

The Vatican has been examining the possibilities of calendar reform, and an announcement is made that the subject is under "constant consideration" at Rome. If the nations were to present the Holy See with a request, it is probable that the approach would be welcomed. But united support is needed.

Arguments in favor of calendar reform are simple. It goes without saying that a year of comparable quarters, months, weeks and days would be a boon to everybody. Any part of any year could be compared with any part of any other year, and that is something which cannot be done at present.

Official Interest

Washington Pathfinder

At last the time is ripe for a revision of the calendar. One of the most significant facts pointing toward this is that many government departments in Washington have taken up intensive study of the matter. And the government has indicated willingness to take part in international conferences on the subject. In case the 12-month World Calendar is chosen, the changes will be slight.

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Charles D. Morris — Charles C. Sutter

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Elisabeth Achelis, *President*

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CHURCHES of America registered themselves more strongly than ever before, on the subject of calendar reform, at the spring meeting of the American Section of the Universal Christian Council. The attitude of the churches has been made clear to the United States government in a letter addressed to the President and the Secretary of State by a special committee, consisting of Dr. S. Parkes Cadman, Dr. Samuel McCrea Cavert and Dr. Henry Smith Leiper. The letter, after stating the connection of the American churches with the research studies which have been made, and the overwhelmingly favorable opinions rendered by the various denominational bodies, says:

"The Universal Christian Council, as the most highly representative coordinating authority among all the non-Roman churches, has been engaged in a formal study of calendar reform for the past four years. The undersigned have been appointed by the American Section to make this formal report to the American government stating the favorable attitude of our churches toward the international proposals for reform of the calendar." From the context it is clear that the form of calendar favored is The World Calendar Association's 12-month plan.

A further part of the report, which constitutes a section of the Minutes of the meeting of the American Section, states: "The calendar has a religious meaning, and a revised calendar will inevitably have an effect in unifying and stabilizing church calendars of all the great communions. The significance of the movement, in its bearing on church unity, is what has won for it the attention and support of church leaders."

The action of the Church of England, and in particular the address of the Archbishop of Canterbury in the House of Lords, has been noted in this country by church leaders and the prevailing view seems to be that all significant obstacles have been removed and any action which the nations see fit to take in the direction of adopting the 12-month revision will be accepted and approved by the majority of all church bodies.

FROM THE MAIL BAG

I shall be glad to support action regarding calendar simplification.—Max Mason, Pres., The Rockefeller Foundation, N. Y.

You are making splendid progress. This will be welcome news to our businessmen. Is there anything we can do to aid in speeding up this good cause?—William H. Zeller, Secretary, Manchester Chamber of Commerce, New Hampshire.

I have been thoroughly acquainted with the high value of your Association's well thought out calendar, and I have sought to bring about its acceptance in the circles in which I may have some influence.—Dr. Walter Simons, Chief Justice of Germany, Berlin.

We are re-submitting The World Calendar plan to our Retail Trades Association for its reaction.—G. P. Backman, Secretary, The Chamber of Commerce and Commercial Club, Salt Lake City, Utah.

I am much interested in the work the Association is doing.—A. M. Damon, Commander, Salvation Army, Atlanta, Ga.

Now is the time to "modernize" our calendar. I favor the 12-month, equal-quarter plan because of its practicability. —G. W. Anthony, Burlington, N. C.

I am very much interested in the possibilities of calendar reform.—Mrs. R. C. Hayden, Principal, Floral Park, N. Y.

We favor the 12-month calendar (World Calendar).—E. C. Logan, Lions Club, Correctionville, Iowa.

I am very much interested.—J. C. Armstrong, Professor, St. Bonaventure Univ., Olean, N. Y.

Heartily in sympathy with the project which you have under way. The articles on the calendar by so distinguished men are very valuable and should be in the hands of high school students and high school teachers, especially of history, geography and general science.—D. W. Morehouse, Pres., Drake Univ., Des Moines, Iowa.

I am strong for The World Calendar.—J. L. Summers, Treasury Department, Washington, D. C.

At this time the major problem in calendar reform is apparently no longer that of constructing an accurate and convenient calendar, but is that of overcoming inertia against change from our present defective system. The World Calendar of 12 months will encounter less difficulty in this respect than would the 13-months proposal, and its intrinsic advantages are such as to call for its universal adoption. —Dr. Calvin B. Bridges, Carnegie Institution, Washington, D. C.

I shall be glad to do anything I can to promote the adoption of such a change, which seems to me to be desirable from every possible point of view.—F. W. Johnson, Pres., Colby College, Waterville, Maine.

Your articles are wonderfully interesting and instructive. I should miss the magazine greatly.—R. E. Hartsock, Prof., Stillwater, Okla.

I think stabilized Easter and Calendar Reform a fine thing.—A. Shiland, Lawyer, New York.

Wish articles could be brought to attention of all college and high school students.—R. D. Smith, Railway Official, Corbin, Ky.

I wish every success to The World Calendar in its efforts to make it prevail.—W. A. Neilson, President, Smith College, Northampton, Mass.

We are enthusiastic in our approval of the paper on Calendar Reform and Education. We are cooperating energetically in efforts to get thoughtful people, especially in the schools, to consider the desirability of calendar reform and to persuade them that the "World Calendar" offers the best reform.—E. C. Coker, Prof. Astronomy and Mathematics, Univ. of South Carolina, Columbia, S. C.

From practical business considerations, we favor a revised calendar—but on the 12-month basis.—Charles H. Watts, Pres., Beneficial Management Corp., New York.

You are working in right direction.—C. F. Heath, Public Accountant, Burlington, Vt.

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S. R. Savier, Scientist, Poona, India.
W. E. Severn, Supt., Corning, N. Y.
M. B. Shane, Teacher, Trenton, N. J.
L. Shu-tien, Educ., Tientsin, China.
A. da Silveira, Commerce, Rio de Janeiro.
A. Sommerfeld, Prof., Munich, Germany.
D. H. Tennent, Prof., Bryn Mawr, Pa.
R. J. Trumpler, Astron., Mt. Hamilton.
E. M. Unglaub, Student, Elizabeth, N. J.
J. A. Van Kirk, Prof., Mitchell, S. D.
V. M. Villamena, Actuary, New York City.
R. J. Wade, Bishop, Stockholm, Sweden.

INTERNATIONAL ORGANIZATIONS FOR REFORM OF THE CALENDAR

ARGENTINA: Comite Argentino del Calendario Mundial, Dr. C. D. Perrine, Chairman, Cordoba Observatory, Cordoba.

BELGIUM: Belgian National Committee on Calendar Reform, Prof. P. Stroobant, Secy., Royal Observatory, Brussels.

BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

BRAZIL: Comite Brasilero del Calendario Mundial, Captain Radler de Aquino, Chairman, Rua Raul Pompeia No. 133, Rio de Janeiro.

CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comite Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

COLOMBIA: Comite Colombiano del Calendario Mundial, Dr. Eduardo Posada, Chairman, Consulado General de Honduras, Apartado 42, Bogota.

COSTA RICA: Comite Costarricense del Calendario Mundial (Igualmente de Guatemala, Honduras, San Salvador y Nicaragua), Don Teodoro Picado, Chairman, Ministro de Educacion Publica, San Jose.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38 Parliament Street, London.

FRANCE: Bureau d'Etudes pour la Reforme du Calendrier, Paul Louis Hervier, Secy., 5 Rue Bernoulli, Paris.

GERMANY: German National Committee on Calendar Reform, Ministry of the Interior, Berlin—Der Weltbund fur Kalenderreform, Dr. Rudolph Blochmann, Secy., 24 Lorsenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform, Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRISH FREE STATE: Committee for Calendar Reform, E. K. Eason, Secy., 80 Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comite Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comite Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, Panama.

PERU: Comite Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatory, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., 4 Jenatschstrasse, Zurich.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, Calle Sierra 2268, Montevideo.

EDITORIAL PARAGRAPHS

The best plan for calendar reform is the 12-month arrangement worked out by The World Calendar Association of New York City. The 13-month calendar seems to be losing favor.—Buffalo (N. Y.) *News.*

For many years the matter of calendar reform has been agitated. It is generally conceded that the present system is out of date and causes much inconvenience in the world at large and also in the Church. The plan that appeals to us as being suited to the requirements of our Church is the so-called World Calendar.—Erie (Pa.) *Atlantic Bulletin.*

The so-called World Calendar proposes to have every Christmas come on Monday, which would allow time over the week-end to clear up the accumulation of affairs before the actual holiday and allow a few hours for leisurely preparations. New Year's on Sunday would even up matters for those to whom that holiday now is just another day. — New Haven (Conn.) *Register.*

From earliest times Masons have been interested in astronomy. Undoubtedly this was true more when Masonry was purely operative. Astronomy as we all know has much to do with the seasons and closely allied are the months and seasons of the year. It does therefore offer Masons a splendid opportunity to interest themselves in a reform that might appeal to them.—*The Masonic News.*

One of the advantages which would appeal to all week-enders is that practically all holidays in the new perpetual calendar would fall on Sunday or Monday and would thus provide a long week-end.—*Montreal Star.*

A calendar which is the same every year would be more satisfactory to business and to society at large.—Wilkes-Barre *Record.*

In all leading countries, students of calendar revision are convinced that the advantages of the 12-month plan outweigh the advantages of the 13-month plan.—Toronto *New Outlook.*

There should be calendar reform, and if women can do anything to help it along, let them take all the credit they wish.—Union City (N. J.) *Hudson Dispatch.*

Had the Eastman 13-month calendar plan been adopted generally, each of the months would include a Friday the 13th. And there you have at least 13 reasons why that proposed revision will never become effective.—Batavia (N. Y.) *News.*

Clubwomen should know that there is a growing conviction throughout the world that the old calendar is defective, awkward and outmoded, and that the time has come to consider seriously a calendar of balance and permanent regularity.—Ridgewood (N. J.) *News.*

British statisticians have for the first time expressed a considered opinion on the question of reforming the calendar. They say that the existing calendar presents real difficulties to their work, and, while strongly condemning any redivision of the year into 13 months, recommend a "fixed" year in which all dates would fall on the same days of the week every year. —Edinburgh *Dispatch.*

The present calendar, which has been in use for the past 353 years, has many defects, many of which could be easily overcome by calendar revision.—Sandpoint (Ida.) *Bulletin.*

Canada, with its rapidly growing Rational Calendar Association, is prepared to play its full part in advocating the adoption of the revised 12-month calendar in 1939. — *University of Toronto Monthly.*

An international movement by scientists to obtain a reform of the present calendar has been launched by the Seventh American Scientific Congress. The 400 delegates, including prominent scientists from every country in North and South America, received a request from the Mexican government for their support on a plan for a revised calendar, and after a committee study of the subject, passed resolutions pledging the full support of scientists to the movement.—Wilmington (Calif.) *Press.*

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

FEBRUARY

S	M	T	W	T	F	S
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
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MARCH

S	M	T	W	T	F	S
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17	18	19	20	21	22	23
24	25	26	27	28	29	30

Second Quarter

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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MAY

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JUNE

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10	11	12	13	14	15	16
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Third Quarter

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

AUGUST

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19	20	21	22	23	24	25
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SEPTEMBER

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10	11	12	13	14	15	16
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24	25	26	27	28	29	30

Fourth Quarter

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
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NOVEMBER

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DECEMBER

S	M	T	W	T	F	S
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24	25	26	27	28	29	30
						*

*YEAR-END DAY, December Y, follows December 30th every year
**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance."—Robert Bridges.

ABBÉ CHAUVE-BERTRAND'S BOOK

ABBÉ CHAUVE-BERTRAND, of Nevers, France, is the author of a book which has just appeared in France, under the title "La Question de Paques et du Calendrier." M. Paul-Louis Hervier, well-known French journalist and literary critic, calls it "the completest and most scholarly treatment of its subject which has ever appeared in the French language." Dr. Edward S. Schwegler, American authority on calendar reform, says it is "without doubt the most satisfactory and complete work of its kind in any language." Mr. P. W. Wilson, book reviewer of the New York *Times* regrets "that the volume is not available in more languages than one, for a translation into English would be of great value."

Abbé Chauve-Bertrand has been a student and advocate of calendar reform for more than 25 years. He has written copiously for Catholic magazines and reviews on the subject, and was a Roman Catholic delegate to the international conference on the subject—the Liège Congress of 1914.

The Abbé was the secretary of the International Astronomical Union's Committee on Calendar Reform, and prepared the Committee's 1922 report, which was the basis on which the League of Nations first took up the subject of calendar revision.

A limited supply of the Abbé's book has been imported by the Journal of Calendar Reform for its readers, and these copies are available at a price of $1 each, postpaid.

ABBE CHAUVE-BERTRAND

Celebrated Roman Catholic authority, whose book on calendar reform has just been published in Paris

(See Articles on Pages 117 to 125)

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CHARLES D. MORRIS CHARLES C. SUTTER

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ORIGINS OF TIME MEASURE

By JAMES HENRY BREASTED

Most distinguished of American archeologists of the present generation, the late Prof. Breasted had long been interested in calendars, past, present and future. A few months before his death he delivered at New York University the annual James Arthur Lectureship on Time and Its Mysteries, under the title "Beginnings of Time Measurement and Origins of Our Calendar." The abbreviated version printed herewith may be supplemented by consulting the complete text as published this month by the New York University Press in a book "Time and Its Mysteries," which contains also the text of lectures by Professors Robert A. Millikan, John C. Merriam and Harlow Shapley.

PROCESSES of matter seem to be the most tangible yardstick which we can apply to that mysterious flow which we call time. But the processes of matter are sublimely indifferent to the insignificant time frontiers erected by man's petty scientific terminology. As if in ridicule of such barriers raised by the children of time, the operations of the universe cross and recross the tiny areas which man has staked out. We are like some frontiersman in the night holding up a torch over a dark stream and imagining that the circle of its hurrying current revealed by the torchlight is all there is to the stream, while there may be Great Lakes above and a thundering Niagara below.

In this brief discussion of a vast subject let me make it clear that I am not dealing with any philosophical conceptions of time or its nature. I am merely endeavoring to present a sketch of some historical aspects of

man's notions of time, by a study of the earliest sources of information available, with the purpose of disclosing especially the earliest known methods of time-measurement and the origins of our calendar.

Modern science has so long been dealing with time as something in *continuous* flow that we accept this conception as a matter of course. This notion of time, however, as uninterrupted duration, in ceaseless, ever-continuing flow, was the final result of ages of human effort to deal with it, and did not arise until an advanced stage of civilization. An American Indian, before he was touched by civilization, would have told you that he was "fifty winters" old, or a younger native would have said that his age was "twenty snows." He thus measured time in disconnected fragments, and throughout the globe that has been the only conception of time discernible by primitive men. Some of these time fragments are fixed seasons in the early man's folk-calendar. Among certain Swedish peasants even at the present day a birthday may fall at the "rye harvest" or at the "potato harvest." A Palestinian peasant may fix the date when a note falls due, not at the end of a continuous series of months, but at the next ripening of the fakûs, a kind of cucumber. Convenient fractions of time may be designated as so many *nights*. In English we still have in common use the period "fortnight," an abbreviation of "fourteen nights." Somewhat less common is the term, "sennight," for "seven nights." This use of nights as a series of disconnected time fragments, still current in English, is of course a survival from primitive usage, like our own North American Indian's measurement of a short journey to a mountain visible on the horizon as "so many sleeps." For a longer journey, however, to the sea far behind the mountain, the Indian would say, "so many moons."

For ages the primitive man had no conception of time, but merely of a series of disconnected units of time, what modern investigation calls "discontinuous time." The short period during which the moon disappears is so brief that a succession of moons was not broken up into disjointed links, and a series of moons therefore gave the early man his longest uninterrupted flow of time. The moon thus became the first continuous time-measurer for periods of time within the year. Almost everywhere the primitive woman knows that, ten moons (that is about nine months) after her periods have stopped, her child will be born. That measurement of the length of pregnancy is one of the oldest continuous time units on record; but it fell short of a year by almost three more moons. The process of linking together the disconnected time units to form a year and thus build up a calendar was an achievement belonging to an advanced stage of civilization.

The cycle which we call a year was of course early observed by primitive man. The changing phases of the face of nature could not fail to attract his attention nor could he fail to notice that certain of these phases

recurred with great regularity. On some of them he was dependent for sustenance and life itself. Every day there impinged upon him some aspect of the natural world, of sky and earth in a sweepingly wide range, from the far-off celestial bodies above to the changing life below, of trees and plants, cattle and birds and insects, and the sacred observances of man himself, based to no small extent upon occurrences in the natural world. While he had noted these recurrences for ages, the early man made no effort to determine the number of days in the cycle between any one of these events and its next recurrence, and thus to establish the length of the year. Simple as it seems to us, the conception of the year, the length of its duration and the mere arithmetic of counting the days which it occupied were far beyond human powers at first. What he did at first observe, however, was that the seasons recurred after an interval of about twelve moons. For ages his ideas of the length of year remained wholly vague as a group of roughly twelve moons. Gradually each moon month gained a name drawn from some event in the life of plants and animals, or some sacred observance of man himself connected with such an occurrence in nature.

The effort to fit the series of moon months into the cycle of the year was never successful. Throughout the ancient world, especially in western Asia and Greece, man struggled with the practical problem of the incommensurability of the length of the year and the moon month. We are accustomed to say that the Greeks were the first people to gain complete intellectual emancipation, but in the measurement of time their men of science suffered under such complete intellectual subjection to inherited tradition in the use of the moon month as a subdivision of the year that they continued to use a year divided into months, of which there were twelve and a fraction in each year. They resorted to elaborate devices for making a term of years equal to a given number of integral moon months. They devised a cycle of eight years with three intercalated moon months or, more accurately, of nineteen years with seven intercalated moon months. The engineer Meton, who adopted the nineteen-year cycle from acquaintance with Babylonian astronomy, knew well enough that his elaborate cyclic scheme did not match exactly with the observed new moons. In view of this fact it is most extraordinary that the Greeks never possessed the intellectual emancipation to reject the moon entirely from their calendar and adopt a conventional month dictated by social needs. They knew of the Egyptian calendar, and in the middle of the fifth century B.C. Herodotus praises it, evidently under the impression that its year of 365 days was correct. But the Greeks had inherited their lunar calendar from Babylonia, and it was so firmly entrenched in their life, beliefs and customs that they were never able to cast it off.

From the earliest times the lunar month dominated the calendar of

western Asia, where it arose at least as early as the fourth thousand-years B.C. under the leadership of Babylonian civilization. The Babylonian kings at first adopted an erratic method of intercalated months inserted at irregular intervals, by royal command whenever the king noticed, as Hammurabi says in one of his letters, that "the year hath a deficiency." He then ordered the insertion of an intercalary month. It was not until 528 B.C. under Persian sovereignty that Babylonia adopted a fixed lunar cycle for the insertion of intercalated months at regular intervals. It was this cyclic system which was introduced from Babylonia by the Greeks. At the very time when the Greeks were thus fastening upon themselves the intolerable inconvenience of a lunar calendar they might have observed that Darius the Great, the ablest administrator of the ancient world, had introduced into the Persian Empire the Egyptian calendar, which disregarded the moon month. The long-established habits of the Western Asiatic peoples, however, and especially the eventual triumph of Islam, resulted in the universal restoration of the lunar calendar. The disharmony between the lunar and the solar year was carried to the absurdest conceivable extreme by Mohammed, who was so densely ignorant of the nature of the calendrical problem that in the Koran he actually forbade the insertion of intercalary months. The so-called "lunar year" of 354 days, being eleven days shorter than the solar year, revolves entirely around the solar year in a little over thirty-three years, that is, about three times in every century.

The authorities of the Jewish church in the Orient avoided such absurdity, and employed intercalation to keep their lunar calendar at least roughly within the framework of the solar year. All western Asia therefore still continues to suffer under the inconvenience of the most primitive form of time-measurement, the lunar calendar.

The Egyptians were the only ancient people who clearly recognized the cause of that inconvenience and possessed the courage and intellectual freedom to remove it. The total incommensurability of the solar or stellar year and the so-called "lunar year" could be discovered only after determination of the length of the solar or stellar year, and recognition of the fact that there is no such thing as a "lunar year."

The determination of the length of the year, together with the discovery that it had a fixed length, was a long slow process lying far back in prehistoric ages. As we shall see, it is an extraordinary fact that it was not the sun which first furnished early man with the length of the year. Other natural phenomena much more intimately within his circle of observation must first have revealed to him the beginning of another annual cycle. The beginning of the annual run of salmon, the blossoming of certain plants or, after the introduction of agriculture, the successive tasks of cultivation might mark the years. The peasants of Palestine call

the years so many "threshing floors"; the Arabs of Lower Iraq count the years by "date harvests"; in the East Indian Archipelago the years are counted by "rice harvests." The conception of a year thus arose gradually. On the East Indian Island of Bali the two monsoon seasons are each made up of a list of months which have the same names and are therefore identical for the two halves of the year. This fact shows us that the two seasons were separated from each other and the conception of the complete year cycle had not yet arisen. The process of uniting the seasons into a year was therefore a slow and gradual one. At first, as may still be observed among some surviving primitive peoples, there arose a list of moon months which did not fill the entire year. After those months were past, before the beginning of a new year, there followed a period of indifferent length, completing the old year. This intermediate period of varying and indifferent length served to adjust the inequality between the solar year and any number of integral lunar months and brought the months into rough correspondence with the solar year. Eventually there arose a list of lunar months, twelve to thirteen in number, which were thought to fill the entire year. There is, however, no equivalence between an arbitrary series of lunar months and a solar or stellar year. Hence there really is no such thing as a "lunar year," and Mohammed's year of 354 days is a creation which corresponds to nothing in nature. Historically, the lunar month has been useful as first suggesting a convenient series of twelve subdivisions of the year, but beyond that fact it has caused endless confusion and complication throughout human history.

The lunar month of course contributed nothing to the determination of the length of the year, and curiously enough the sun, the other great luminary, did not first enable man to discover the year and determine its length. While the sun's apparent revolutions shift their positions from season to season they nevertheless go on in an unbroken series with no beginning and no end. The sun's apparent motions therefore did not at first suggest the year cycle. It is quite evident that primitive men had very early begun to observe the stars and to notice the reappearance of a prominent star or group of stars after it had been invisible for a time. Such a reappearance was an event which cut sharply into the sequence of events in the stellar sky, and easily came to mark the beginning of the year. In several regions of South America the word for Pleiades is the same as the word for year. In the eighth century B. C. Hesiod places his agricultural program in the calendar by observing the return of the Pleiades in May. If the Greeks had only continued to build up their calendar on this stellar observation, they might have saved themselves centuries of difficulty and complication with their inherited Babylonian lunar calendar.

In prehistoric ages, many thousands of years ago, the dwellers along the Nile, the greatest river known to ancient man, very naturally began

their year with the beginning of the annual rise of the vast river, as the most important terrestrial phenomenon of which they knew and also the source of fertility on which an agricultural people depended for their very life. The four-month season of the inundation, which fructified the fields, was followed by another four-mouth season of planting and cultivation, and a third and final four-month season of harvest. This year of three four-month seasons was obviously one which arose out of the life of an agricultural people. It was essentially an agricultural folk-calendar, and its months were obviously moon-months in the beginning and doubtless continued to be so for thousands of years.

But, like primitive man everywhere, these earliest known agricultural peasants along the Nile had begun at a very remote date to scan the heavens and observe the stars, probably some thousands of years before Hesiod was doing the same in the eighth century B.C. There is probably no other country in which Sirius, the Dog Star, the brightest of the so-called fixed stars, is such a brilliant and noticeable spectacle in the evening sky. In the latitude of Lower Egypt Sirius rises about four minutes earlier every day. Every fifteen days he rises about an hour earlier, so that eventually he rises in full daylight, when he is of course entirely invisible. After a period of some months of invisibility, this brilliant and beautiful star suddenly reappears on the eastern horizon at sunrise. This "heliacal" rising of Sirius, as it is called, is a noticeable and sharply defined event. By a remarkable coincidence this heliacal rising occurs very near the time of the beginning of the inundation. In antiquity this date was the nineteenth of July. By a lucky accident, the beginning of the year at the advent of the inundation in the enormously ancient peasant calendar was thus fixed at the moment of an important astronomical event. The basis of the calendar which was to become that of the civilized world was therefore a stellar, not a solar year.

It is important to notice that the earliest observances of the heliacal rising of Sirius must have been very primitive in character, as we shall later illustrate. Persistent dust storms, such as we experience today, desert fogs and mists or sometimes storm clouds must have made the determination of the exact day when Sirius reappeared on the eastern horizon not a little uncertain. It is certain that the length of the stellar year as measured by successive sunrise reappearances of Sirius was at first roughly established by the Egyptians as 360 days. As early as the fourth thousand-years B.C., that is, well back of 3000 B.C. we find this 360-day year divided into thirty-six decads of ten days each, for grouping the constellations along the celestial equator. This appearance of a circle of thirty-six decads in the fourth millennium B.C. is highly significant. It is certainly the oldest appearance of a circle of 360 divisions. The Sumerian sexagesimal system, in which sixty appears as a numerical unit (called

šuššu), is without doubt enormously old; and in all probability arose from the length of the year—360 days—by dividing it into six parts. It seems probable, as concluded by Zimmern, that *šuššu*, the Babylonian word for sixty, means "one sixth." In both Babylonia and Egypt the convenient and basic number (360), of fundamental importance in the division of the circle and therefore in geography, astronomy and time-measurement, had its origin in the number of days in the year in the earliest known form of the calendar. While its use seems to be older in Egypt than in Babylonia, there is no way to determine with certainty that we owe it exclusively to either of these two countries. A common origin older than either is possible.

The Egyptians found their primitive 360-day year very convenient in business and social life, and it therefore survived far down into the historic age; but as their observations of the heliacal rising of Sirius accumulated, they finally discovered that the year, as they thought, contained 365 days. We are in a position to determine the date when they took administrative action to make this discovery of the approximate length of the year practically effective. In the year 4236 B.C., as determined by Borchardt, some now unknown ruler of prehistoric Egypt, without doubt residing in Heliopolis, introduced a calendar year of 365 days. It began with the heliacal rising of Sirius, that is, on the nineteenth of July. This calendar contained the three old agricultural peasant seasons: the inundation, the cultivation and the harvest, each season containing four months. The epoch-making importance of this calendar lies in the fact that these twelve months were entirely divorced from any connection with the moon, so that the deviser of the calendar could make each month thirty days long. By the addition of five feast days at the end of the year, this year of twelve thirty-day months or 360 days became the earliest known and practically convenient calendar of 365 days.

The only celestial phenomenon to which any attention was paid in devising this calendar was the establishment of the beginning of the year at the first heliacal rising of Sirius. In other words, the mind that devised this calendar put social and economic needs first and divorced the calendar from celestial processes. It is of the greatest interest to observe that this calendar inevitably soon parted company with Sirius, for, owing to the fact that the stellar year is about a quarter of a day longer than 365 days, Sirius rose a day late, every four years; that is, at the end of the fourth year after the introduction of the calendar he rose on the second day of the New Year or one day late; at the end of eight years two days late; that is, on the third day of the year; at the end of twelve years three days late; that is, on the fourth day of the year; and so on to the end of the year. The calendar-makers did not at first observe this discrepancy, and when they finally did become aware of it, they held to the supremacy of social con-

siderations, and made no attempt to shift the calendar back into harmony with Sirius. Eventually, therefore, in four times 365 years, that is in 1,460 years, the Egyptian calendar revolved entirely around the celestial year. A remark by Censorinus informs us that in the year A.D. 139, Sirius rose on New Year's day, that is, New Year's day in the civil calendar of Egypt once more coincided with the heliacal rising of Sirius. It is easy to compute that the next earlier coincidence of this kind must have occurred in 1318 B.C., the next earlier in 2776, and a still earlier one in 4236 B.C. Archeological considerations forbid us to suppose that we may push back still another such period of 1,460 years. We may therefore conclude that the civil calendar of Egypt was introduced in 4236 B.C.

This date, near the middle of the forty-third century B.C., is not only the earliest fixed date in history, but also the earliest date in the intellectual history of mankind. It has been well said that "the Egyptian calendar is the greatest intellectual fact in the history of time reckoning," but it is far more than that. For the introduction of this calendar was an intellectual feat, marking the dawn of a recognition of the supremacy of social requirements. As we have already remarked above, in divorcing this new calendar from the processes of nature, the Egyptians were recognizing for the first time a world of social needs which they placed first. It is today the earliest known such recognition, and the earliest dated intellectual event in human history. It ushered in the great epoch, which was in full development after 4000 B.C., when the Egyptians discerned that their once purely nature-gods, who had originally been only personifications of natural forces and natural phenomena, like the Sun-god Re, or the Vegetation-god Osiris, were gradually shifted from a world of natural processes to be arbiters in a newly discerned social arena, where moral forces were emerging. The calendar was thus the beginning of a great movement in human life which carried over the thought of man from the world of nature to the world of human life.

This remarkable calendar remained the exclusive possession of the Egyptians for over thirty-five hundred years after its introduction. The effort of Darius the Great to introduce it into Western Asia late in the sixth century B.C. proved unsuccessful. The Greeks, as we have seen, wasted their scientific gifts in adding one futile refinement after another to the hopelessly inconvenient and complicated Babylonian lunar calendar. Nearly four and a half centuries after the fruitless attempt of Darius, another great administrative genius gave Europe for the first time a sane calendar. In 46 B.C. Julius Caesar introduced into the Roman Empire the Egyptian calendar, with one important modification. He provided for the addition of one day to the year of 365 days once in every four years. The history of this important innovation is interesting.

The first knowledge of a year of 365 days was brought to Europe by

Thales, the Ionian philosopher, who learned of it on a visit in Egypt. Curiously enough, Herodotus also learned of it there and praises it as a perfect solution of the complications due to the incommensurability of moon-month and year. Neither Thales nor Herodotus seems to have known that the year of 365 days was too short. It is obvious that the Egyptians early observed the rate at which the heliacal rise of Sirius diverged from the beginning of the calendar in their civil year, revealing to them that their 365-day year was a quarter of a day short. The extraordinary achievements of the Babylonian astronomers in the Chaldean and Persian periods included a computation of the length of the solar year by Naburi-mannu, or Naburianos, as the Greeks called him. Not long before 500 B.C. this great astronomer calculated the length of the solar year as 365 days, six hours, fifteen minutes and forty-one seconds—a result which is only twenty-six minutes and fifty-five seconds too long. This is the earliest known close approximation to the length of the solar year.

For over a century and a half no one seems to have made any practical application of this new knowledge. It was not until the third century B.C. that the Egyptians made an effort to correct the error in the length of the year. We still possess the granite stela of Ptolemy Euergetes I, bearing his decree, dated in the year 238 B.C., which commanded that every fourth year should be one of 366 days. But the Egyptian people obstinately refused to conform to this decree, and the correction in the calendar never became effective.

In 380 B.C. the able Greek astronomer and mathematician Eudoxus visited Egypt and there learned the fact that the year was really about 365¼ days long. Then for the first time this fact became common knowledge in Europe. Some two centuries later, that is, early in the second century B.C., the great Greek astronomer Hipparchus announced that 365¼ days was in error, that is, it was too long by one three-hundredth of a day. This error was unknown to Caesar, and we all know that for this reason in March, 1582, the Julian calendar was superseded by that of Pope Gregory.

It is evident, however, that Julius Caesar brought to Europe for the first time a sane calendar system of twelve thirty-day months. If jealous Roman emperors and other scientifically ignorant meddlers had not utterly disfigured the Egyptian calendar, we would not be calling the ninth month September (with the numeral seven), the tenth month October (with the numeral eight), the eleventh month November (with the numeral nine) and the twelfth month December (with the numeral ten)! Nor would our young people be obliged to learn and repeat a verse of poetry in order to find out how many days there are in a month.

With the introduction of the Egyptian calendar time became something in which *human* processes were, so to say, systematically staked off into

annual stages and substages. These subdivisions of a calendar, particularly the shorter ones, arise only at an advanced stage of social development. The origin of the month was of course due to a celestial phenomenon, but that of the week was in origin purely human and social. A market week of three, four, five, six, eight and ten days is a calendar division of purely secular origin. It is found over practically the entire globe, where civilization has advanced sufficiently to possess arts and crafts, with exchange and commerce of a primitive kind. It is quite commonly a *rest* day on which work is forbidden. There is a universal connection between market day and religion. Among some peoples, as among the Hebrews, the religious significance of the day predominates, and the feature of rest becomes a religious mandate. For our subject, the week, whatever its origin or significance, is of slight importance, for the week has played practically no part in time-measurement.

For many reasons, which are too obvious to need enumeration, the smaller subdivision, the day, has always been of fundamental importance in the measurement of time. It is extraordinary that among the various peoples there should be such wide diversity in the understanding of just what a day is. Modern astronomers consider a day as beginning at midday and therefore lasting from midday to midday. The peoples having a lunar calendar conceive the day as lasting from evening to evening; while in modern life the day begins at midnight and lasts from midnight to midnight, a point of practical convenience as marking the transition from one day to the next, and ignoring the night. This conception of a twenty-four-hour day is not even yet in our railroad time-tables. We really have two periods of twelve hours each, very inconveniently distinguished in our time-tables by leaded or black-faced type suggesting darkness at *midday*, which we sagaciously shift to light-faced type, suggesting daylight at *midnight!* The modern languages possess no word for the twenty-four-hour day. Only the ancient Greeks seem to have possessed such a word in their convenient νυχθημερον. The Egyptians began the day at dawn, which seems the natural thing for an originally peasant people to do. The practise of beginning the day at dawn was adopted by Europe at an early date, and continued down into medieval times. It was the introduction of the striking clock, in the fourteenth century of our era, which shifted the beginning of the day to midnight.

There was as much diversity in the *length* of the day as in the time of its beginning. In view of the varying length of the *daylight*-day no one finds anything strange about a flexible or elastic day. It is in the subdivisions of the day that we have come to expect constant length. Division of the day into hours is unknown to primitive peoples. The Greeks and Romans in the West and the Chinese in the East had originally no hour divisions of the day, which they all received from the Near East. The

Greeks were accustomed to identify times of day by such cumbrous devices as "the time of full market," which was the middle of the forenoon. Subdivision of the daylight-day into twelve parts was introduced into Egyptian life at a very early date. We find it in the Pyramid Texts, and this means that it was practised in the fourth millennium B.C., that is, before 3000 and possibly as early as 3500 B.C. The Egyptian was interested in a convenient division of his day into twelve parts, but he was not concerned that these twelve parts should be of constant length. The reason for this probably lay in his early timepieces. The Babylonians also possessed a subdivision of the day at an early date, but it divided the daylight-day into six parts, and the night into six more.

Of periods longer than a year the primitive mind had but the vaguest conceptions. Indeed primitive men may entirely lack the *conception* of even a year.

With the advance of civilization man's increasing knowledge has had a profound influence upon his conceptions of time, and especially his discernment of ever-lengthening periods of time. The astonishingly long reigns claimed for their early rulers by the scribes of Egypt and Babylonia must have been compiled in a primitive age of naive and childish fancies, whose fantastically impossible periods could not have grown out of any just impressions of time as measured by human history.

The earliest known annals of a nation compiled in the twenty-eighth century B.C. covered some fifteen hundred years of human history, that is, they extended from the forty-third to the twenty-eighth century B.C. The men of the Pharaoh's court, therefore, in the twenty-eighth century B.C., that is, some 4,700 years ago, could look back upon a lapse of time a little longer than that which we survey as we contemplate the period that lies between us and the so-called fall of Rome in A.D. 476. For those men time had long since ceased to be a discontinuous duration.

In Babylonia the cycle of nineteen years for the intercalation of the lunar months evidently discloses a conception of time as a continuous flow of duration. It was introduced in 528 B.C.

It is evident that historical impressions of the long and continuous flow of time, especially for some centuries before the beginning of the Christian era, had led the men of the Hellenistic Age and the early Roman Empire to their dreams of a thousand years, which have left us the rather misleading significance of the word "millennium" as a Golden Age.

It is rather natural science than human history which has so enormously expanded our modern conception of the flow of time. About 400 B.C. the Chaldean astronomer Kidinnu, whom the Greeks called Kidenas, discovered the precession of the equinoxes, involving a cycle of twenty-six thousand years. That was the longest period revealed by the vast celestial clock for many centuries, indeed, perhaps even into modern times. It was

followed by the geologists' estimates of the length of the periods required for the formation of the earth. Much more precise are their computations of the length of the much later process which has produced the present surface of the globe.

The computations of De Geers have shown that it is about nine thousand years since the retreating ice of the Glacial Age reached its present latitude, while the investigations of the American geologists would indicate that the Ice Age began probably a million years ago. Such researches have revealed to us this imposing panorama of terrestrial processes as the vast stage where we discern earliest man emerging as the only implement-making creature, whose prehistoric life is thus disclosed interlocking with the processes of nature, which formed our globe. It is a tremendous spectacle: the geological process, marching hand in hand with the cultural advance of man.

Such disclosures of the position of man in the universe form for us the culmination of man's sense of time as an historical process no longer discontinuous. We begin to feel a range of time measured by the emergence of the life of man in the universe, until we are aware that there is no time apart from man. Those celestial processes with which our knowledge of duration now begins, as they are disclosed to us in incomprehensible gulfs of millions of light years, are for us essentially timeless. We now recognize that modern investigation of early man has revealed him to us filling the gap between the incalculable duration of the celestial processes on the one hand and on the other the more comprehensible periods of the terrestrial processes that formed our globe as the home of man and led over to the historic age.

Thus in vastly remote prehistoric ages, when the present surface of our globe was being fashioned by geological forces, we begin to see man, all unconscious of those forces about him, but suddenly revealed to us rising out of them and entering a realm of time, because he was, and still is, the first and only creature to be aware of time. He was its creator, the first being possessed of the ability to look back along his own trail and to recognize the point in the timeless process of the universe where the creature man entered a new and mysterious realm, which by that very fact made him the creator of a domain of time.

PRIZE ESSAY AWARDS

AWARDS of three prizes for essays on calendar reform have been made by the editors of the British magazine, *Mine*, published in London. The terms of the contest provided that the essays must be suitable for use in broadcast talks or interviews. Winners of the contest were: *First prize*, Caldwell Harpur, Gwythian Road, Hayle, Cornwall; *second prize*, Miss Jocelyn Allan, 37 Upper Brook St., London; *third prize*, Miss Kathleen Wildman, 74 Chingford Mount Road, South Chingford, Essex. The winner of the third prize is a British school girl, 13 years old.

A PLAN FOR ENACTMENT

By Doctor Walter Simons

Former Chief Justice of Germany

IT is my opinion that calendar reform is an international movement which calls for international participation and action. In 1923 the League of Nations undertook the leadership in the movement to bring about an improved calendar for the general benefit of mankind throughout the world, and in 1931 called together an international conference at which 44 nations surveyed the economic and social aspects of the simplification of the Gregorian calendar. Germany took an active part at the conference and her delegate clearly and emphatically stated her position in the following terms:

> "Some speakers have erred, I think, in saying that the present world economic crisis prevents serious consideration of calendar reform at this time. They have stated that 'in the existing depression, it is necessary to concentrate attention on problems of more vital importance.'
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> "The German delegation takes an opposite view. In fact, it is the present economic crisis which seems to us the most urgent argument for breaking away from old institutions created for other periods and operating to hamper and injure modern economic activity.
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> "This is the reason why the great majority of organizations consulted by the German Committee have pronounced themselves in favor of calendar reform. It is a reason which the German Government has made its own and supports emphatically.
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> "In Germany the inconveniences of the present calendar have been discussed very thoroughly with industrial organizations, both on the side of employers and employed, and with representatives of education and science. We find that the inconveniences of the present calendar are generally recognized—the inequality of the different parts of the year, the instability of the calendar and of the date of Easter.
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> "I do not want to waste your time over these details, which are so well known to you, but I wish to catalogue them briefly to emphasize the tremendous importance of the economic factors which in our opinion make the immediate consideration of calendar reform desirable."

Today, in a world of seriously disturbed conditions, the peaceful calendar reform is most opportune and increasingly important, as there exists in the movement no national preference, special interest and political bias. I believe therefore that the League of Nations should welcome international action and enactment of calendar reform which it has so consistently advocated, and will set in motion definite and constructive steps leading toward an international conference being called in 1937 at which international enactment will enable the revised calendar to be put into operation by 1939. Its success in the matter would immediately enhance the League's prestige and authority. It should prove a grateful task, in the sense of the Article 23 of the pact, to render possible a closer

relationship between the nations of the world through a vigorous and timely promotion *now* for a uniform and improved calendar.

If, however, the League should not act in the matter, then it is very possible—indeed most probable—that some leading government, whether it belongs to the League of Nations or not, would lead the way toward enactment of calendar reform. It could through legislative means in its own country, enact the proposed new calendar, with the provision that the revised calendar would become valid throughout the country, whenever it should have been similarly adopted by a determined number of other governments. And toward this accomplishment it could call an international conference.

As to the calling of an international conference by a single nation, the German Reich might well take such a step, which in its transcendental importance, affects the culture and civilization of the entire world and its leaders as well as the man-in-the-street. Germany is in a position to make such a move, owing to its world-wide trade relations and contacts with other countries.

Amicable international accord is not a visionary ideal but a practical reality, as was clearly demonstrated in the Easter Act Resolution endorsed by the League of Nations in 1931 and which received the unqualified approval of 26 nations. Among them were Great Britain, France, Italy, Spain, the United States of America, Sweden, Chile, Switzerland and Greece. I am glad to say Germany was one of the signatory nations approving the Act.

For more than a decade there has been heard, with an increasing frequency of opinions from the circle of the Christian-Ecumenical church movement, a strong voice advocating the unification of the calendar. The interest of churches can be explained by the uncertainty of the Easter date, which is still determined at the present time according to the phases of the moon and not according to the solar year. The origin dates from the Jewish Passover.

It is a well-known fact that this traditional adherence, which sets the Easter date on the first Sunday after the full moon following the Spring equinoxes of each year, received its sanction during the reign of the first Christian ruler of the Western world, Constantine the Great, in the fourth century A.D. Easter fluctuates within the extreme limits of 35 days and in addition to this, there is a diversity of dates on which Easter is celebrated by the Greek-Orthodox and other Christian churches. This fluctuation of Easter, upon which many other Christian holidays depend, is of utmost importance not only for the church year, but for the school year, for the life in common of the members of the family and for the business life of every individual and nation. According to the general opinion, it is responsible for many inconveniences. On the other hand, cal-

endar reform would have as an immediate result, the establishment of a fixed date for the Easter holiday. It is hardly possible to conceive any objection being raised from a religious point of view against this fixation of the Easter date; on the contrary, it looks absurd that up to the present time, holidays, in commemorating the historical events in the earthly life of Jesus, should have been celebrated according to an arbitrary rule which results in such a wide range of dates. The first logical step would be to set the Easter Sunday on the day, which according to the historical and astronomical calculations, agrees with the greatest probability with the original history of the Passion. It seems that it should fall within a day or so at the end of the first week in April,—April 9th in the present and April 8th in the new calendar. For this reason the British Parliament, as early as 1928, declared itself in favor of fixing the Easter Sunday on the second Sunday in April, even though it did not have any intention at that time to improve the Gregorian calendar.

It is hardly probable, however, that the initiative for the final calendar reform should come from the churches, but it is more than probable that should calendar reform come the churches themselves would not offer resistance to such a reform.

The initiative of general calendar reform is reserved to the lay world. The trouble in the past has been that for this future calendar, multitudinous plans had been advocated by individual calendar reformers, who were actuated more from their preconceived ideas and one-sided point of view than from the broad outlook of the world at large. This situation was clarified and simplified at the international conference on calendar reform, in 1931, when from the higher point of view, two plans were chosen for further consideration: one of them advocating a year of 13 months and the other a year of 12 months, both of them having a uniform structure and certain intercalations. The contrast between the two reflects the traditions of the human calendar wisdom from time immemorial.

Nature has supplied mankind with three cardinal points as a base for measuring time: first, the change of day and night, then the change of the phases of the moon, and finally the change of the seasons of the year. A natural consequence of this was that mankind, from time immemorial, has measured the time according to days, months and seasons of the year. Unfortunately, however, these three measures of time are irrational in relation to one another. A month cannot be evenly divided into days, and a year cannot be evenly divided into days and months, and the seasons do not conform with the phases of the moon. A part of humanity has preferred to reckon time according to the phases of the moon, and the other according to the influence of the sun which causes the seasons. The 13-month calendar more or less follows the more subdued light, the

moon, and the so-called World Calendar, the more brilliant light, the sun.

All the nations which distinguished themselves in observing the skies and reckoning the time, were finally forced to adopt a combined solar and lunar year. The mere reckoning according to the moon rapidly gets at variance with the seasons of the solar year, and the mere reckoning according to the sun calls for complicated adjustments with the phases of the moon. In both instances, the true reckoning of the calendar forces upon it, at longer or shorter intervals, certain special periods of intercalation.

Those peoples who achieved the greatest progress with regard to the accuracy of this intercalary reckoning were the ancient Babylonians with their lunar calendar, the Egyptians with their solar calendar, which survives in our present calendar, and the highly gifted Central American Mayas with their astonishing calendar; whereas the Greeks and particularly the Romans always had a certain amount of confusion in their calendar until an end was put to it by the ingenious reform of Julius Caesar.

The Julian reform of the calendar, based on the Egyptian, introduced a regulated leap year by intercalation of one day and, after surmounting certain childhood diseases, held sway over the church and business life of the European world until the beginning of modern times. But even the Julian calendar with its intercalary system remained behind the true march of the seasons in the year, so that in the 16th century, Pope Gregory XIII was forced to advance the time by ten days, using a sort of "coup de main." His reform was at first accepted only by the Roman-Catholic Church, while the Protestant churches continued an opposing resistance, "for religious reasons," which lasted into the 19th century. The Greek-Orthodox Church even holds fast to the Julian system up to this date, likewise "for religious reasons," even though the countries where it dominated have adopted the Gregorian calendar for all matters of civil life after the end of the World War. As far as the non-Christian nations opened their doors to the European civilization, they have adapted themselves to the dominating calendar, but otherwise they still preserve a great variety of systems. Among them the Mosaic calendar plays a particular part.

The strongest initiative which is at work in Germany on calendar reform comes from the American World Calendar Association which has its headquarters in New York, but maintains at Geneva an international committee for cooperation and endeavors to encourage the work at the League of Nations. The World Calendar proposed by this Association is distinguished by a particular clearness, practicability and its evident conformity with the interests of the lay world as well as those of the churches. It consists of four equal quarters of three months each, which are com-

parable to the four seasons of the year; the first month of each quarter has 31 days, the second and the third 30 days each; each quarter of the year begins on Sunday. At the end of the twelfth month there is intercalated the year-end day (Sylvestre), and during every leap-year a mid-year or leap-year day is placed at the end of the second quarter of the year. These extra days are considered as extra Saturdays and are inserted at the end of December each year and at the end of June every four years respectively, by which the days of weeks and months exactly coincide with one another from year to year. Easter falls on April 8th, and the rest of the church year is regulated in accordance with it. There is provided in this plan, a clear, comprehensive and invariable standard both for the church and the business life.

No other plan and particularly the entirely unpractical 13-month calendar has the slightest prospect of general approval in comparison with The World Calendar. The mere fact that it destroys the half and quarter divisions of the year and nullifies the seasonal divisions of the year, (upon which depends man's nutriment and around which the farmer plans and reaps his crops), relegates the 13-month calendar to an extremely restricted scope of usefulness.

A calendar like that of The World Calendar Association with its practical and ideal arrangement, wherein all the various time-periods harmonize so perfectly with each other, would obviously have a like beneficent reaction in all its varied applications.

I am convinced to such a degree of the importance of this movement and of its usefulness to the world that I unhesitatingly give The World Calendar my wholehearted allegiance and am equally convinced that immediate steps preparing for its enactment should be taken by the League of Nations, and if this is not possible, then by an individual nation in order that the new calendar may become effective by January 1, 1939, a Sunday; that is, if the new calendar is to avoid any such violent measure as the reform adopted by Gregory XIII, wherein 10 days were dropped from the calendar.

In the fields of social betterment lie the outstanding successes of the League. Calendar reform gives it yet another opportunity for enhancing its prestige for world betterment, and in this effort, Germany stands ready to take her part with her sister nations.

CALENDAR DIFFICULTIES

DR. PAUL MONROE, President of the World Federation of Education Associations, submits the following official dating of a magazine devoted to the Near East and India, as an example of calendar difficulties existing in the world today:

"February 13, 1936 (New Style); January 31, 1936 (Old Style); Shebat 20, 5696 of the Jewish Calendar; Dhulkaada 20, 1354 A. H. of the Moslem Calendar; Amshir 5, 1652 of the Coptic Calendar; Bahman 23, 1314 of the Iranian Calendar."

DR. S. PARKES CADMAN

By the Rt. Rev. William T. Manning

Bishop of New York

It is peculiarly appropriate that Bishop Manning should contribute to the Journal of Calendar Reform a summary of the calendar reform activities of the late Dr. S. Parkes Cadman. For under the forceful leadership of Bishop Manning, the subject of calendar reform was formally presented to the Episcopal Convention in Atlantic City in 1934, resulting in the adoption of a comprehensive resolution by both the House of Bishops and the House of Deputies. This action preceded by nearly 18 months the formal approval of calendar reform by the Anglican Church, made public in an address by the Archbishop of Canterbury in the House of Lords on March 4, 1936.

ON July 12th, international calendar reform suffered the loss of one of its foremost leaders among the clergy of the world, Dr. S. Parkes Cadman, honorary moderator of the Congressional Church of America, president of the Federal Council of Churches, chairman of the American Section of the Universal Christian Council and a president of the Council itself.

For more than three years Dr. Cadman had been a member of the Advisory Committee of The World Calendar Association, a member of the Standing Committee on Calendar Reform of the Universal Christian Council, and an active advocate of calendar reform in international forums.

Dr. Cadman was born in England in 1864 and entered the Methodist ministry there before coming to the United States in 1890. His first charge in this country was at Milbrook, N. Y. He came to New York City in 1895, as pastor of the Metropolitan Temple, moving six years later to the Central Congregational Church in Brooklyn, of which he was still the active pastor at the time of his death. He was often compared to Henry Ward Beecher as a preacher, but the radio gave Dr. Cadman a vast audience which Beecher could not reach in his day.

From 1924 to 1928, Dr. Cadman was president of the Federal Council of Churches, and international recognition of his leadership of the American churches came with his election in 1925 as head of the American Section of the Stockholm Conference on Life and Work. From then, up to his death, he devoted a large amount of his time to international activities, going abroad at frequent intervals as a spokesman for the Protestant churches of America. He was the author of many books, the last of which was published within a few months of his death.

Calendar reform came to Dr. Cadman's attention with the early activities of the League of Nations which sought to bring about an agreement

on this subject between religious and civil authorities. From the beginning, he was a consistent and devoted advocate of revision, supporting the League of Nations' program for securing a definite commitment from all the church bodies throughout the world.

It was his recommendation that was largely influential in inducing the Universal Christian Council, in 1932, to undertake a four-year study of calendar reform. This study progressed until in 1935, the world churches were ready to appoint a standing committee "authorized to communicate with governments and with any influential groups or personages for the purpose of advancing the cause of calendar reform." The membership of this committee included besides Dr. Cadman: the Bishop of Chichester, representing the Archbishop of Canterbury; the Archbishop Germanos, representing the Ecumenical Patriarch of the Eastern Orthodox Church; and Bishop Ammundsen of Denmark, representing European Protestant groups. Despite some changes, it remains practically the same to date.

A year after the formation of this committee under Dr. Cadman's leadership, the American churches completed a study of calendar reform, bringing matters to the point where he could address a memorial to the President of the United States and the Secretary of State, signed by a special committee of the American churches, explaining officially their attitude. "The Universal Christian Council," he explained in this document, "has been engaged in a formal study of calendar reform for the past four years. The undersigned have been appointed by the American Section to make this formal report to the American government stating the favorable attitude of our churches toward the international proposals for reform of the calendar. . . . The calendar has a religious meaning, and a revised calendar will inevitably have an effect in unifying and stabilizing church calendars of all the great communions. The significance of the movement, in its bearing on church unity, is what has won for it the attention and support of church leaders."

Dr. Cadman's far-seeing, vigorous and tactful leadership was visible throughout the gradual development of the calendar reform movement in the vast arena of church government. A firm foundation for this development was laid at a meeting in Eisenach in 1929 of the Continuation Committee of the World Conference for Life and Work. It was agreed on that occasion that the churches should, when the time came, "take part in the international inquiry into these questions." Three years later, Dr. Cadman's proposal for a formal study of calendar reform by the churches was accepted by the Universal Christian Council at its Geneva meeting. This study was immediately begun, and its results were reviewed by world church leaders at meetings in Novi Sad in 1933, in Fano in 1934, and in Chamby in 1935.

At the time of his death, Dr. Cadman was preparing for the final

presentation of the conclusions of the world churches at a meeting in Switzerland in August. He had carefully studied the proposed resolutions on the subject, particularly with a view to their most effective presentation later to the Council of the League of Nations. The program which he advocated was fully carried out at the Chamby meeting, in spite of the fact that death prevented his giving it the personal attention and advocacy which he had planned to do. He believed that calendar reform would receive the world-wide and official approval of all the churches—both Protestant and Catholic. The vote at Chamby in August of this year completely fulfilled this expectation.

> "A reform of the calendar and the stabilization of Easter would, if carried through, receive the support of the overwhelming majority of the Churches, providing it is based upon the perpetual twelve month equal-quarter plan proposed by the League of Nations.
>
> "Therefore, be it resolved that the Universal Christian Council instructs its Standing Committee on Calendar Reform, to notify the Secretary General of the League of Nations concerning the above report and to secure the most effective presentation of this action of the Churches at the forthcoming world conference on Calendar Reform and the stabilization of Easter and finally,
>
> "That this Council asks the Churches to inform their respective Governments of this action and of their views with regard to the desirability of adopting the new calendar."

Dr. Cadman was largely influential in calling the attention of the world to the earnest leadership which the Eastern Orthodox Church was prepared to give to the cause of calendar reform. His hopes and predictions for the future of this cause were fulfilled this year when the Archbishop of Canterbury, speaking officially on the floor of the British House of Lords, threw the full support of the Church of England on the side of calendar revision in the significant words: "I have found it impossible to resist the plea for reform in this matter, which comes, I think it may be said, with practical unanimity from the representatives of all the great organizations of trade, industry and commerce throughout the civilized world."

Dr. Cadman had hoped to live to see the fruits of his labors for calendar reform become a practical and enacted fact. He joined with the Archbishop of Canterbury in expressing a fervent belief that it would be a real misfortune if this matter were allowed to drift on to a point where it could not be consummated in 1939. At least as far as the great church communions were concerned, he lived to see all the necessary preparations completed so that no obstacle on their part can prevent the civil authorities of the nations from carrying out the program of the League of Nations for legislative enactment at that time.

LA QUESTION DU CALENDRIER

A Biographical Note and Three Reviews by American Authorities

As a frontispiece to this issue of the JOURNAL, there appears a recent photographic study of the Abbé Chauve-Bertrand of Nevers, France, whose book on calendar reform has just been published in Paris under the title "La Question de Paques et du Calendrier." The book, bound in the French manner in paper, sells in Paris at 16.50 francs. A limited supply has been imported by the JOURNAL OF CALENDAR REFORM for its readers. These copies are on sale for $1 each, postpaid.

CHAUVE-BERTRAND'S BACKGROUND AND PERSONALITY

By PAUL-LOUIS HERVIER

French Journalist and Author, Secretary of the French Bureau of Studies on Calendar Reform

WITHIN the past few weeks there has appeared in Paris a 256-page book on the subject of calendar reform, from the pen of the Abbé Chauve-Bertrand of Nevers. The title is "La Question de Paques et du Calendrier," the publisher is the notable house of "Les Oeuvres Francaises." The book was published with the full authority of the Church, as testified not only by the customary *Nihil Obstat* and *Imprimatur*, but also by a comprehensive preface from the pen of the famous Abbé Cabrol of England, venerable author of twenty standard works on the liturgy and editor of a Latin-English Missal that is used in many Roman Catholic churches in England and America.

Instant recognition of the importance of the book came from reviewers both of the clerical and lay press. Although the author modestly described his work as a "revision" or "second edition" of a somewhat smaller book which appeared in 1920, it was immediately recognized that his earlier book had been completely re-written and that the present volume was the completest and most scholarly treatment of its subject which has ever appeared in the French language.

The Abbé Chauve-Bertrand has been a student of calendar problems for more than a quarter century. He commenced his studies of the subject as early as 1901, while he was a member of the Benedictine community in Ligugé, Belgium. During the six years which he spent there, he gathered a vast amount of research material which he planned to embody in an exhaustive work on the political and religious evolution of human society. One of the projected chapters of this work was to deal with the evolution of the calendar and the by-play of civil and religious influences which had affected the world's systems of time measurement.

In 1907, he went to Spain, to become Secretary and collaborator of the famous Father Guepin, who had just returned from Rome, where—in co-operation with Abbé Cabrol—he presented to a Benedictine Congress a

plan for revision of the monastic breviary. In the following year, Father Guepin published a monograph which resulted in 1911 in the promulgation of a Papal Bull on liturgical reforms of the breviary, the missal and the general calendar of the Church. (In relation to the calendar, this edict dealt only with the rearrangement of certain secondary feasts.)

Father Chauve-Bertrand, while working with Dom Guepin, conceived the idea of pushing still further into the field of the church calendar. He began to envisage the possibility of promoting a general interest in the stabilization of the movable feasts and perhaps a revision of the Gregorian calendar. He was assured that the Vatican approved of his plans.

With this support and encouragement, he ventured to publish his first monograph, in a group of four prominent Catholic reviews. His articles attracted widespread attention and resulted in an extensive correspondence which has continued ever since.

Meanwhile there had developed an active international interest among European statesmen and politicians in the subject of general calendar reform. This interest seems to have been aroused largely as a result of the discussions among Catholic scholars of the problems of the church calendar. The two movements for revision went on side by side, but it does not appear to have occurred to anybody that they were not separate and distinct matters, at least not until a group of international agencies summoned the Congress of Liege for the consideration of calendar reform, in 1914. The Church was invited to attend and participate in the deliberations and the Abbé Chauve-Bertrand was among the forty-odd delegates.

He had already begun the preparation of a book embodying the results and conclusions of his researches, and the Liege meeting prompted him to push it through to immediate completion. It was, in fact, ready for the press by midsummer of 1914, when the World War suddenly called every loyal Frenchman to the colors. The Abbé was in military service until 1919, when he was honorably discharged and returned to his priestly duties in his native diocese of Nevers. The book which he had written five years before was still in manuscript, and one of his first cares was to submit it to a Paris publisher. A year later it came from the press, under the title "La question du calendrier."

The book won the attention of Professor Bigourdan, director of the Paris Astronomical Observatory, who promptly invited its author to attend the Congress of the International Astronomical Union in Rome, at which the subject of calendar reform was to be discussed and the attitude of astronomical leaders defined. As an expert on the calendar, Chauve-Bertrand was made a member of the Union's Commission on the Calendar, and later was chosen secretary of this Commission and prepared its report, which became the basis on which the League of Nations first took up the subject of calendar revision. The Chauve-Bertrand report, indeed, has

become a fundamental part of calendar history, having been the first document circulated on this subject by the League of Nations to governments and religious authorities.

Between the years 1912 and 1928, the Abbé Chauve-Bertrand published more than 20 articles on the subject of calendar reform in the leading Catholic reviews of France, Belgium and Spain. The titles illustrate the range and completeness of his studies: Stabilization of Easter, Plans for Revising the Gregorian Calendar, Future Reform of Our Calendar System, Changing the Civil Calendar, The Year's Beginning, Peace and Calendar Reform, Are We Going to Change the Calendar?, Elements of Time Measurement, Farewell to the Julian Calendar, Practical Calendar Progress, Shall We Have a New Calendar?, Triumph of the Gregorian System, Story of the Eras, Catholics and Calendar Reform, A Plan for a New Calendar, Various Kinds of Years, The Cycle of the Weeks, Turkey and the Calendar, League of Nations Plan for New Calendar, etc.

Since 1928, the Abbé's contributions to periodical literature have been less frequent, although library indexes record five important contributions published in the Catholic Almanac, La Vie Catholique and La Croix.

Meanwhile his 1920 book, after a re-printing, was no longer available for those seeking an authoritative work on calendar reform. Moreover, there had been important developments since that time which the author felt should be chronicled. About a year ago he began a complete re-writing of the text, and the result was a practically new work.

A characteristic of the book is that it takes up the subject in all its aspects—historic, scientific, social, astronomical and religious. The author combines all these factors in a delightfully convincing synthesis.

Almost simultaneously with the appearance of his book, the Abbé Chauve-Bertrand was honored with election as Vice-President of the International Committee on Calendar Reform at Geneva, a distinction which he shares with Lord Desborough of England and the Archbishop Germanos of the Eastern Orthodox Church.

It is a pleasure for the writer of this brief biographical notice to record the delightful personal association which he, as secretary of the Bureau d'Etudes pour la Reforme du Calendrier, has had with the Abbé Chauve-Bertrand. The distinguished churchman and scholar is a man of great personal magnetism, deep sincerity and warm sympathy.

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A CHURCHMAN'S REVIEW OF THE BOOK

By Edward S. Schwegler, D.D.

Priest of the Roman Catholic Diocese of Buffalo

The estimable Abbé Chauve-Bertrand, who has long been known as a student of questions appertaining to the history and improvement of the calendar, has written a book which is without doubt the most satisfactory and complete work of its kind in any modern language.

It treats, first, of the origin of the calendar, taking in turn the history of the Chaldaic or Babylonian, the Hebrew, the Egyptian, the Coptic, the

Hindu, the Chinese, the Toltec, the Aztec, the Greek, the Arabian, the Mohammedan, the Turkish, the Roman, the Julian and the Gregorian calendars. There is then a sketch of the modern movement for calendar reform and an analytical consideration of various plans that have been advocated in the past few years. In a third lengthy section Father Chauve-Bertrand treats thoroughly all the elements of the calendar that might be in need of reform: the leap year rule, the wandering week, the beginning of the year, the number of months, the names of the months, the date of Easter, etc.

The bibliography at the end of the book gives some indication of the work's thoroughness. References go anywhere from Plutarch, Macrobius, Venerable Bede, Clavius, to Comte, Cotsworth, Duchesne, Eginitis, the League of Nations and the Journal of Calendar Reform.

The only recent English work comparable to the one under consideration is Alexander Philip's *The Calendar, Its History, Structure and Improvement* (Cambridge, 1921). And Father Chauve-Bertrand may well feel proud of the tribute which he received from Mr. Philip: "Your work is a masterpiece. . . If I had previously known about it, I would not have written my book."

By way of conclusion the author devotes a few remarks to his own opinion as to how the calendar should be reformed; and there can be no doubt of his conviction that the 12-month plan, widely known now in many countries as The World Calendar, is the best solution of the whole problem. He says:

"A reform of the calendar cannot be a real reform unless it makes the year unchangeable. To do this, we cannot avoid the necessity of breaking the absolute continuity of the weekly cycle by omitting a day in ordinary years and two days in leap years.

"Then, we must choose between the 12-month plan, with equal quarters of 91 days each, and the 13-month plan, with months of 28 days each. . . It can no longer be doubted that the latter, which once had many proponents, is declining in popularity. The plan which retains the 12 months is prevailing more and more; during the last few years it has attracted a most impressive majority of followers and seems called to be the elect of heaven. . ."

Looking towards the future, the author then expresses some profound considerations that will appeal especially to the clerical student:

"Amid the misgivings caused more or less on all sides by the trend of current events and by the fear of even graver developments, it would be splendid to see the representatives of all the countries of the world meet at Geneva and adopt a single universal measure of time—the seed, mayhap, of future agreements on other points.

"And it would be equally splendid and consoling to behold the Christian Churches reunited in a new Council of Nice, reaffirming their agreement

as to the sacred day of Easter and making statements that would lead to greater Church Unity.

"And finally, another notable result which one would like to see ensue from the universal adoption of a fixed calendar would be the extension of Sunday as a day of rest to all the peoples of the earth."

Here and there the student may be inclined to disagree with the author, although the latter can always quote good authority for what he says. A case in point is the oft-repeated story of the Emperor Augustus "stealing" a day from February and adding it to August, a story which, by all indications, is more fable than fact.

If this work should appear in still another edition, one might suggest a few additions that would make it even more valuable. There could be, for instance, an extensive explanation of all the astronomical facts that lie behind the history of the calendar. These facts are at times very puzzling, and they tend to scare people away from a consideration of calendar reform. There might also be tables for the ascertaining of the Easter date and for the calculating of the weekdays corresponding to various dates in different years of the present Gregorian calendar. If reform comes, such tables would always have historical value; and if it does not come—*quod Deus avertat!*—the tables would continue to be of very practical service to readers of the book.

This work, while covering its subject from all angles, has a special significance for Catholic students of calendrical matters; for not only does it bear the *Imprimatur* of ecclesiastical authority, but it contains an important preface by the renowned liturgical scholar, Dom F. Cabrol, Abbot of St. Michael's, Farnborough, England.

The following statement of Dom Cabrol is of particular import: "When the time comes that the League of Nations, which has already studied this question, can show that there is universal agreement among all nations using the Gregorian calendar (about the advisability of reform) and that the proposed plan is scientifically better than the present calendar and meets with support on all sides, it is probable, not to say certain, that the Holy See would be disposed to say, in the words of Leo XIII, 'the introduction of such a reform would meet with proper consideration.'"

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A MASTERLY VOLUME

By P. W. Wilson

Well-known Book Reviewer for the New York Times

In Reading this modest but masterly book, we have been impressed by the Abbé's detachment from all partialities, his serene reliance on the ascertained conclusions of science and scholarship, and his full recognition that he is dealing with an instrumentality which is necessary to the community

as a whole, secular as well as sacred. Our one regret is that the volume should not be available in more languages than one. A translation into English would be of great value—not only as an excellent guide to knowledge of the calendar, but as an example of that tranquillity amid turbulence which is the heritage of those whose times are in tune with the eternities.

About the Gallic intellect at its best, there is an especial and irresistible excellence. It may be summed up in the single word "lucidity"—a beautiful word meaning the clarity that shines like a crystal in its clean-cut certitude.

It is an exquisite and ultimate lucidity that adorns the pages of this brief yet comprehensive treatise on the calendar. Libraries of source material have been absorbed, yet without bewildering a scholarly mind. The Abbé Chauve-Bertrand surveys a vast and perplexing field of research. But he always sees the point, and only those who have attempted the task which the Abbé has achieved can appreciate what such an achievement involves.

The calendar has been, on the whole, a contribution by faith to the life of man. The measurement of time was regarded as a mysticism within mathematics and it is by the name of a Pope that our Gregorian calendar is known. In these pages, this great tradition is revealed in the perspective of universal history. It is a very gracefully proportioned map that the Abbé has drawn. But it embraces the world.

The success of the book is due to arrangement. First, we have a parade of the Calendars. Egyptian, Chaldean, Hebrew, Greek, Roman, Chinese, Hindu, Coptic, Mexican, they pass before us in solemn processional, not in the dull robes of pedantry, but as the actual instruments of civilization. The record is factual and no words are wasted. The pageant of time is, on that account, more impressive.

Out of the review there emerges what was adopted as the Roman Calendar—Julian, Augustan and Gregorian. All the other systems of measuring time recede into the background. It is on our modern Calendar that the Abbé concentrates his attention. The field is narrowed into the main highway of human progress. Much is alleged against western institutions. But the western calendar is the only calendar that can ever be universal.

The treatise sweeps forward into the future. The Abbé refuses the assumption that the Gregorian calendar, despite its superb merits, is a chronometrical finality. He sets forth a truly astonishing catalogue of proposals for improving the calendar and thus demonstrates that active minds in many countries have been at work, often independently, on a fascinating problem.

As the Gregorian calendar has proved to be, compared with others, a survival of the fittest, so among suggested reforms of the Gregorian calendar, it is the fittest that will inevitably survive. The Abbé hardly needs to specify what that choice must be. His references to The World

Calendar are corollary to his entire presentation of a majestic panorama.

Our only criticism on the book is that, as we think, undue emphasis is laid in the title on the problem of Easter. We realize that this is a problem of especial interest to the Abbé because of its ecclesiastical significance. We agree also that the allusion to Lord Desborough's services in advocating a fixed Easter is well deserved by that patient and diplomatic pioneer. But important as the date of Easter undoubtedly is, this volume is not limited to that subject.

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CLARIFYING THE WORLD-WIDE VIEWPOINT

By H. Parker Willis
Professor of Banking, Columbia University

Within the past few years there has been an increase in growth of interest among business men, particularly among bankers, with regard to the subject of calendar reform or improvement. As yet, it cannot be said that opinion is finally crystallized in favor of a distinct plan, and one reason for the failure to make measurable progress in the direction of definiteness has been the doubts that have been entertained by many with regard to the obstacles that might stand in the way of a change which would inevitably call for the cooperation of ecclesiastical authorities and for their ratification in the determination of the details. In a very real and practical way, therefore, the ascertainment of the attitude of the Church in its various branches toward an innovation which would so radically alter the Church calender as well as secular calendar arrangements is of direct significance in the field of finance and business, as well as in that of statistics, especially those of commercial importance. For this reason, if for no other, any careful piece of work which helps to clarify the condition of opinion generally with regard to calendar reform has a broad bearing and an interest to the business world that might otherwise be neglected. The lay reader, therefore, will receive as of corresponding value this volume by Abbé Chauve-Bertrand, in that it makes plainer than heretofore the precise position of the Catholic Church in regard to proposed changes in the organization of the calendar and thus makes fresh contribution to the task of gauging and estimating the attitude of the various important elements in the study of the calendar, whose ideas must be fully appraised and reckoned with as a preliminary to actual progress.

In order to clarify the ecclesiastical attitude on this subject, the author makes a historical survey of the evolution of the present calendar from the beginning of history; this he embodies in the first chapter of his work. Later on in the book, he gives a chronological résumé of the history of the calendar, running back to the year 4241 B.C. and mentioning the principal dates at which most important calendar changes have been introduced. Chapter II is then devoted to a review of the actual proposals for reform

that have from time to time made their appearance. The volume terminates with a brief concluding chapter in which the author takes account of some comments and criticisms that have been offered with regard to the first edition of the book (published in the year 1920). In this concluding comment Abbé Chauve-Bertrand remarks that "One would not be inclined to consider very seriously the various projects which have had for their purpose the mere equalization of the length of the months, nor would one give any greater attention to those that suggest the establishment of quarter years, each containing two months of 28 days each and one of 35 days, nor can he take very seriously the idea of a 53rd week of the year which, at stated periods, is introduced with the inevitable result of breaking the regular rotation of the weeks. Reform will not be truly serious unless it is able to establish a perpetual calendar. In order to do this, there is no escaping the necessity of breaking, to the extent of one ordinary day in each year, and to the extent of two days in every twelfth year, the absolute continuity of the cycle of weeks."

"Accordingly," adds Abbé Chauve-Bertrand, "it will be necessary as the basis of any reform, to choose between the plan of having 12 months divided into equal quarters of 91 days each, and on the other hand the idea of a 13-month year with 28 days each month. Undoubtedly, the proposal of a 13-month year, which has had a considerable number of supporters, would be a backward step. The plan of preserving the 12-month year, which has always had priority, becomes more and more obvious as a necessity, and at the present time it draws to itself an imposing majority of supporters."

This conclusion is endorsed by the writer of the Preface to this volume, the distinguished Abbé Cabrol of England. He, after noting that the question of the calendar has for generations been a problem of importance to the whole world, remarks that the work of Abbé Chauve-Bertrand is a valuable summary of all the arguments pro and con which have made their appearance, and is therefore recommended to all Catholics who are interested in the question. "It is, of course, necessary," he says, "to inquire the thought of the Holy See on the subject, since all writers about calendar reform will understand that no proposal is likely to succeed unless it can call to its aid the support of the Catholic Church." He calls attention to the fact that Abbé Chauve-Bertrand's historical research has developed two or three definite expressions—the one from the time of Pope Leo XIII, and a much more recent expression of 1924. This is a subject which Abbé Cabrol is eminently qualified to discuss, since he was himself the head of a mission which went to Rome in 1935 to inquire into the attitude of the Vatican on calendar reform. He is himself an ardent supporter of calendar revision and the report of the mission indicated that opinion at Rome was definitely in favor of the proposed 12-month equal-quarter calendar.

It is undoubtedly true that the clerical authority for the arrangement

of the calendar is likely to maintain itself, supported as it is by church tradition and decisions of the past. Reform must therefore enlist in its behalf authority similar to that which supported the Gregorian revision. The value of Abbé Chauve-Bertrand's work is thus found in the fact that he has assembled through careful calendar research the ecclesiastical basis for present calendar practices. He has moreover shown exactly at what point the validity of existing methods ceases to find support from the Church and depends entirely upon secular practice and reasoning. His preference for the 12-month calendar as the result of his own researches is thereby rendered the more significant and valuable.

OBITUARY NOTES

PROF. PAUL STROOBANT, leading astronomer of Belgium, head of the Belgian National Committee on Calendar Reform, and member of the Foreign Advisory Committee of The World Calendar Association, died in Brussels on July 15. He had been for nearly a generation the director of the National Astronomical Observatory in Brussels, professor of Astronomy at the University of Brussels and chairman of the Science Branch of the Royal Academy of Belgium. His interest in astronomy dated from his early youth: at the age of 14 he began observations of comets which led to the publication of his first scientific monograph when he was only 16. Three years later he published a work on the satellite of Venus, based on studies he had made at the University of Brussels. He was only 22 when he was appointed to the faculty of the College of France, attached to the Paris Observatory. He returned to Belgium before he was 30, and devoted the remaining years of his life to his work there. His interest in calendar reform was of long standing, and he had attended every important international conference on this subject since 1910, being one of the leading advocates of the 12-month equal-quarter plan.

DR. JUAN CARULLO, one of Argentina's leading bankers and a member of the Comite Argentino del Calendario Mundial, passed away recently at his home in Mendoza. Dr. Carullo, an ardent advocate of calendar reform in Latin America, was responsible in no small degree for the successful effort made by the Argentine Committee in bringing the merits of The World Calendar to the Argentine people.

REV. DR. EDMUND B. CHAFFEE, director of the Labor Temple, New York, and a social worker of national reputation, died on September 15. A member of The World Calendar Association for the past four years he was able as editor of the *Presbyterian Tribune* to interest a large religious audience.

WALTER H. SEELY, former editor of *Success Magazine*, died in Philadelphia on June 23rd. Formerly an advocate of the 13-month plan, he became a member of The World Calendar Association, and was instrumental in bringing this plan before the reading public.

OTHER deaths among the membership of The World Calendar Association during the past few months included: John Hays Hammond, mining engineer; Senator Duncan U. Fletcher, United States Senator from Florida; James M. Beck, former member of the House of Representatives; Joseph W. Byrns, Speaker of the House of Representatives; Randolph Perkins, member of the House of Representatives; Dr. Walter Laidlaw, Secretary of the New York Federation of Churches; William Butterworth, chairman of the Board of Directors of Deere and Company; Marlen E. Pew, editor of *Editor and Publisher;* Frank C. Munson, president of the Munson Steamship Company.

SWISS LAW AND NEW CALENDAR

A Study by the Swiss Committee for Calendar Reform of changes in Swiss internal law, required when revised calendar is adopted.

(Abstracted from the German by C. D. Morris)

IN 1930, the Departments of the Interior of the Swiss government met at Berne to discuss the question of calendar reform and the Swiss Committee for Calendar Reform was organized. Extended and continuous inquiries by this Committee resulted in a large majority of all important Swiss organizations and public leaders giving their assent to the necessary arrangements for introducing the reform in Switzerland—naturally in conjunction with other principal nations.

There can be no doubt, therefore, that the proposed perpetual calendar (the proposal which retains the 12-month division of the year) will be sanctioned and approved by the Swiss people.

Although the League of Nations' international conference of 1931 did not push the calendar reform proposal to a conclusion, there can be no doubt that the plan for a revision of the calendar will shortly be brought forward again, with a view to enactment.

For this reason, it has seemed desirable to the Swiss Committee to proceed with a study of the internal laws which will require modification or change, in order to comply with the new calendar, and what the necessary modifications will be. Therefore, the Committee has referred the principal questions which will arise to the foremost Swiss authorities for their legal opinions. Their answers are published in this report.

The statements herewith made, cover the most important points on which questions are likely to arise. These authoritative statements are definite proof of the need for drawing up definite recommendations and regulations in connection with the introduction of the new perpetual calendar. The advance arrangements, legal and otherwise, must be clear and definite, so that leases, contracts and agreements made under the old calendar system will continue without interruption or controversy under the new system. Certain small disarrangements and innovations must be anticipated and fully provided for.

CONSTITUTIONAL PROBLEMS

Question No. 1. What is the legal procedure to be followed in the introduction of a reformed calendar in Switzerland? Answer by Prof. Dr. D. Schindler of Zurich:

"The competence of the Confederation in the matter of introducing a new calendar comes under Article 40 of the Constitution, which gives the central government jurisdiction over weights and measures. The

words *weights and measures* are defined as including all those computations which are necessary for the uniform and orderly regulation of daily life, and of economic and technical intercourse. This definitely includes measures of time (Cf. Burckhardt's *Kommentar der Schweiz. Bundesverfassung*, 3d Edition, pp. 341-2), as well as the measurement of time—that is, the calculation of hours and days, and anything else embraced in the term *chronology*.

"There is another question of competence, however, which arises. The new calendar will undoubtedly be introduced on the basis of an international agreement, expressed in a treaty. Now, it is generally accepted that the federal government, without regard to the constitutional separation of power between the Confederation and the cantons, may conclude an international treaty on any subject. Moreover, it is generally accepted that the federal government may take the necessary measures to carry out the provisions of such a treaty. Naturally this covers the signing of a treaty between states regarding the introduction of a new calendar.

"There is almost no doubt that the Constitution of the Federation permits the signing of such a treaty. (Cf. *Constitution*, Article 85, Section 5). But if any doubt exists, the question can be put to a facultative referendum, under Article 89, Paragraph 3, of the Constitution.

"The effect which the execution of the calendar reform treaties will have on existing Swiss legislation depends of course on whether the terms of the treaty are immediately applicable. New laws will be necessary to remove contradictions, and the final correction of existing laws may be only solved through experience with the new calendar. But it would be to the interest of all concerned that everything possible be done to amend existing legislation in a formal manner, so that it may be in complete harmony with the new situation."

CIVIL CODE CHANGES

Question No. 2. How far will the provisions of the Swiss Civil Code become inapplicable under the new calendar and what changes must be made? Answer by Prof. Dr. Fritzsche of Zurich:

"Examination of the laws of contracts—for example, with reference to the time allotted for fulfillment of obligations, wages, rents, employment, etc.—shows that these require certain definite changes with the introduction of a perpetual calendar. For instance, the end of a month never falls on a Sunday under the new calendar, and certain passages in the law (see Law of Obligations, Section 77, numbers 2-3) providing for this contingency are no longer necessary. The old provisions for legal holidays will require examination and revision. The labor legislation now in force provides that wages of workers must be paid at intervals no greater than two weeks, with the result that these pay periods never

coincide with the entire or half of the calendar month. The regularity of the new calendar suggests that each month may contain two periods for payment; it is evident that this would greatly simplify the keeping of accounts, payrolls, records and statistics. . . .

"The new calendar provides for a weekly period of eight days at the end of each year (and similarly at the end of the half-year in leap years). The present Swiss law dealing with the weekly rest period visualizes only the hitherto existing week of seven days. It should be amended to fit these exceptional cases, as any conflict with the existing rest-day regulations should be avoided. . . .

"It has been proposed by some exponents of calendar reform that the Year-End Day (Sylvester) at the end of December and the Leap-Year Day at the end of June quadrennially, should be made international holidays. This would be most unwelcome in large districts of Switzerland, but obviously the proposals for such holidays are optional and not a proper part of the framework of calendar reform.

"The Civil Code deals at length with questions of time as related to legal process, but calendar reform should not offer any special difficulties in this respect. However, whatever questions arise should be simplified; at all times simplification of time problems should be insisted upon. This applies also to the calendrical aspects of the cantonal civic code.

"To summarize: no particular difficulties need be expected from the standpoint of the present Swiss Code with the introduction of a perpetual calendar of 12 months. In fact, some simplifications will be introduced, which in the aggregate will be important and desirable, not only from a practical viewpoint, but also in their legal and procedural connection."

PRIVATE LAW

Question No. 3. Will the proposed reform of the calendar have any effect on the codes of private law and citizenship law? Answer by Dr. Url. Stampa, Director of the Citizenship Bureau of the Swiss Confederation, Berne:

"Certainly no adverse effect. I can say without hesitation that no one need suspect any *prejudice* in the new arrangement of the calendar. The advantages which it brings to civil life can also be shared by the code of laws which regulate the rights and duties of citizens. The recording and authentication of dates, as in our vital statistics, will be simplified, and it will not suffer at all in the transitional stage. This will also be true in regard to the whole structure of private law and contractual law."

BANKING

Question No. 4. How will the revision of the calendar affect banking laws? Answer by Dr. Hegetschweiler, adviser in international law to

the Swiss Credit Institution, Zurich, and a well-known authority on this subject:

"Between the old calendar and the new, there is a maximum difference of two days between the comparative dates. This difference is not a matter of great importance to the banking world, but it must be clarified in legislation so that there can be no incertitude as to the meanings of contracts and obligations which carry through the transitional period.

"For instance, there are many operations which start at the beginning of a month and expire at the end of a month. In case a transaction is to expire at the end of February under the old calendar, the question arises: does it expire on February 28 or 30, under the new calendar? The new calendar does not contain the dates March 31, May 31, August 31: definite legislation must provide that the dates of March 30, May 30 and August 30 should be substituted.

"Certain other questions will arise around the new dates of February 29, February 30 and April 31, as well as the dates designated as *Year-End Day* and *Leap-Year Day*. These questions must be studied and definitely met in the transitional legislation."

INSURANCE LAW

Question No. 5. How will the revision of the calendar affect insurance laws? Answer by Dr. Müller, counsel for the Swiss insurance companies:

"It can be said with emphasis that the introduction of the proposed perpetual calendar will not cause any special difficulties. This is true for the entire Swiss civil code, the laws of contract, the insurance laws of 1908 and the legal remissions and ordinances of the Confederation. The periods of time, which are known as 'Fristen' in the law, are stipulated entirely on the basis of days, weeks, months or years. Some of the provisions of Article 77 of the *Law of Obligations* or contracts will lose their present importance, because they apply mainly to the irregularities and changeabilities of the old calendar. But in general the legal problems which arise in insurance matters can be easily dealt with, under the new calendar,—such as, whether an event took place a day earlier or a day late, whether the burning of a building or the loss of a ship took place on a day covered by the insurance contract, or whether the date can be fixed for any given event in which an insured person is involved."

In conclusion, the Swiss Committee desires to state that all the authorities agree in condemning proposals for a 13-month calendar. It is clear that such a drastic change would be followed by great difficulty and that many provisions of Swiss law would be inapplicable to such a system.

Prof. Dr. E. Marchand, *President*
E. Hofmeister, *Vice-President*

Zurich, March 26, 1936.

U. S. OFFICIAL STATEMENT

By Elisabeth Achelis

President, The World Calendar Association

FROM Washington comes a government statement on calendar reform, strongly urging revision of the calendar and advocating an international conference to discuss the matter with a view toward obtaining definite enactment of the proposed change.

The statement comes from the Central Statistical Board, a coordinating group of officials representing all departments of the Government and operating under a Cabinet Committee—composed of the Secretary of the Treasury, the Secretary of Agriculture, the Secretary of Commerce and the Secretary of Labor.

The subject of calendar reform came before this Board through a request from the State Department for guidance in international discussions of calendar reform. The Central Statistical Board was asked to make a study of the questions involved and to submit a report which could be used in formulating the policy of the United States Government.

Studies by the Central Statistical Board have been going on for more than a year, and have now resulted in a definitive report to the State Department. The report is entirely favorable to the general idea of calendar reform. It recommends (1) that the United States send representatives to any meeting called by the League of Nations on the subject; and (2) that the United States support proposals for the calling of an international convention on calendar reform.

The report emphasizes "the increasing advocacy of calendar reform in this country" and the "widespread support for a special international convention to discuss the matter thoroughly." It explains that "the need for the establishment of a perpetual calendar is now agreed upon by a very large number of business interests, and is sympathetically viewed by the agencies of the Federal Government dealing with statistics," and continues, "We would urge participation by this country in such an international convention," whose decision thereafter could be presented to the countries of the world for action and adoption.

The Central Statistical Board recognizes and is keenly appreciative of the studies and activities undertaken by the Commission for Communications and Transit of the League of Nations for calendar reform. At the same time the Board notes that the Commission, being chiefly concerned with transportation and communication matters, is not in a position to carry the reform to the actual stage of commitment, and

therefore suggests that the Commission should recommend to the League of Nations the calling of a special international convention.

The complete text of the report of the Central Statistical Board, together with the acknowledgment by the State Department, is published in a footnote below. It is an important document in the history of the world's progress toward a newer and better calendar.

It will be noted that the American declaration is similar in tenor to the official pronouncement made by the British Government last March in the course of the House of Lords debate led by Lord Merthyr, Lord Desborough and the Archbishop of Canterbury, all advocates of calendar revision. At that time, the spokesman for the British Government promised that the subject of calendar reform, whenever it came up for consideration at the League of Nations, would have "the most sympathetic and serious consideration of the representatives of His Majesty's Government."

The British statement was interpreted a few days later by Lord Desborough in The London Times. He said in part: "It would appear that the active opposition to reform was really opposition to the 13-month scheme, and that the allegations of public apathy on the question, although true of 1931, are much less true today. Such a subject as this cannot of course be expected to excite the passionate interest of the general public, but it is a fact that many responsible bodies have passed resolutions in favor of a moderate scheme of reform. It is satisfactory that the Government has promised that the question will have the most sympathetic and serious consideration of their representatives at Geneva. The movement for a general reform of the calendar has developed widely."

EDITOR'S NOTE: The Central Statistical Committee of the United States Government consists of: Daniel C. Roper, Secretary of Commerce; Frances Perkins, Secretary of Labor, (Chairman of the Central Statistical Committee); Henry Morgenthau, Jr., Secretary of the Treasury; and Henry A. Wallace, Secretary of Agriculture. Its subsidiary, the Central Statistical Board, includes the following: Stuart A. Rice, Chairman; Isador Lubin, Vice Chairman, Commissioner of Labor Statistics, Department of Labor; Oscar E. Kiessling, Chief Economist, Mineral Resources and Economics Division, Bureau of Mines; Mordecai Ezekiel, Economic Adviser to the Secretary of Agriculture; E. G. Draper, Assistant Secretary of Commerce; E. A. Goldenweiser, Director, Division of Research and Statistics, Board of Governors of the Federal Reserve System; George C. Haas, Director of Research and Statistics for the Treasury; E. Dana Durand, Commissioner, Tariff Commission; Corrington Gill, Assistant Administrator in charge of Research, Statistics and Finance of the Works Progress Administration; W. H. S. Stevens, Assistant Chief Economist, Economics Division, Federal Trade Commission; Leonard D. White, Commissioner, Civil Service Commission; Ernest M. Fisher, Director, Division of Economics and Statistics, Federal Housing Administration; and Frederick F. Stephan, Secretary-Treasurer, American Statistical Association.

The resolution on calendar reform of the Central Statistical Board is included in the following letter addressed to the Secretary of State, signed by Stuart A. Rice, Chairman:

"My dear Mr. Secretary: With further regard to our letter of March 8, 1935, on the subject of calendar reform and the answer thereto of March 18, 1935 (file WE:570.B5/45), signed for you by the Under Secretary, I am directed by the Central Statistical Board to inform you that we have had the several questions of calendar reform under further consideration. . . . The Central Statistical Board recently held a special meeting at which there were present representatives of the two chief associations interested in calendar reform, together with a number of representatives of Government departments and agencies and non-Government interests. . . . As a result of the discussion at this special meeting, the matter of calendar reform was given further consideration at the last regular meeting of the Board. I am directed to report to you several actions taken by that meeting. . . . The Central Statistical Board recognizes that the United States can take no action with regard to agenda items for the next meeting of the Commission on Communications and Transit of the League of Nations, which, we understand informally may be called into session this autumn. Nevertheless, we believe that the Department of State should be informed of the increasing advocacy of calendar reform in this country and of the

Thus England and the United States, the two great English-speaking nations, are in accord and ready to participate in the movement for a revision of the calendar through a specially-called international convention.

Other countries are aligning themselves with this movement. Germany's attitude, defined at Geneva in 1931, is further emphasized in recent unofficial declarations by the Ministry of the Interior. It is stated yet again in an article published in this issue of the *Journal of Calendar Reform* from the pen of Dr. Walter Simons, former Foreign Minister, Chief Justice and interim President of Germany. Dr. Simons urges the League of Nations to lose no time in the summoning of an international convention on calendar reform.

France, despite financial and political preoccupations, continues its interest in revision of the calendar, energetically advocated at Geneva by Senator Godart and the other French delegates to the International Labor Conference. Senator Godart has recently stated that he proposes to bring this subject up for consideration before the French Senate and to obtain a definite commitment from the French government, aligning it with England, Germany and the United States for immediate international action toward a convention at which a treaty would be drafted for the enactment of a new calendar. The traditional intellectual leadership of France on the European continent has brought forth, during the past few weeks, the most significant book on calendar reform yet published. It is written by the Abbé Chauve-Bertrand of Nevers, whose work carries a British endorsement in the preface by the venerable Catholic liturgical scholar, Abbot Cabrol of England.

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wide-spread support for a special international convention to discuss the matter thoroughly. . . . The need for the establishment of a perpetual calendar is now agreed upon by a very large number of business interests and is sympathetically viewed by the agencies of the Federal Government dealing with statistics. The Board believes that advocacy by the United States of either of the two chief plans of calendar reform at this time would be premature. It is the Board's further belief that the Commission on Communications and Transit of the League of Nations is not the proper body to decide the relative merits of the two chief plans, but that the Commission might be induced to report to the League a recommendation for the calling of an international convention. We would urge participation by this country in such an international convention called to decide upon one plan, which thereafter could be presented to the countries of the world for further action and possible adoption. . . . In the light of these beliefs, the Board has directed me to transmit to you the following resolution:

"BE IT RESOLVED that, if the subject of calendar reform is included as an agenda item for the next meeting of the Commission on Communications and Transit of the League of Nations, the Central Statistical Board hereby requests the Secretary of State to consider the advisability of sending representatives of the United States to such meeting, and BE IT FURTHER RESOLVED that the said Board requests the Secretary of State to consider the advisability of recommending that any delegate or delegates to such meeting be instructed to support a recommendation from the said Commission to the League of Nations that an international conference be called to discuss the several matters pertaining to calendar reform."

The formal acknowledgment of the State Department, addressed to Dr. Rice as Chairman of the Central Statistical Board, is as follows:

"My dear Mr. Rice: I have received your letter of August 4, 1936, informing me of the studies made by the Central Statistical Board on the subject of calendar reform and conveying to me the text of a resolution on the question recently adopted by the Board. . . . I note that the Board recommends in its resolution that the Government of the United States send representatives to the next meeting of the Commission on Communications and Transit of the League of Nations, if the subject of calendar reform is included in the agenda, and that such representatives be instructed to support the proposition that an international conference be called to discuss the several matters pertaining to calendar reform. . . . You may be assured that should an invitation to participate in a meeting of the Commission on Communications and Transit be received, the views of the Central Statistical Board will receive careful consideration by the Department of State.

"Sincerely yours, William Philips, Acting Secretary."

Italy, Spain, Holland and Belgium continue their long-standing interest in a new calendar and are ready to participate in the proposed international convention. With them are found also the Scandinavian governments, the Baltic nations and the Near Eastern group, including Greece, Yugoslavia and Turkey.

Switzerland was the first European state to advocate calendar reform, and it has legislated further on the subject than any other country in the world. The report of its 1931 calendar committee, recommending international enactment of a revised calendar, was officially approved before the Swiss Parliament and given a full vote of endorsement. Recently the same Swiss Committee has completed a survey of opinion by leading Swiss legal authorities on the internal legislation which will be necessary in connection with the change from the old to the new calendar.

Latin-American countries are a bloc in approving calendar reform. Leadership of this movement is lodged in the Chilean government. The Chilean delegates at Geneva, reinforced by other South American representatives, are earnestly pressing for League of Nations action. Mexico has considered the subject through a committee appointed by the Foreign Office and has obtained a complete agreement among all government departments in support of a revised calendar. Mexican leaders have recently expressed impatience at diplomatic delays and have suggested that the Mexican government is ready to call an international convention, to sit in Mexico City, if the League of Nations should not be in a position to act promptly.

In the Far East, the Japanese government has reiterated the clear stand which it took at the Geneva Conference of 1931.

The attitude of the churches, which was long a reason for international hesitation in calendar reform, has been greatly clarified during the past few months. At Chamby, Switzerland, in August of this year, the Universal Christian Council, central body of all non-Roman churches, concluded its four-year study of calendar revision and declared itself unhesitatingly and most emphatically for a new calendar. Members of this great ecclesiastical body include the Eastern Orthodox Church, the Church of England, and all the large Protestant Churches of Europe

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EDITOR'S NOTE: Text of Resolution passed by the Universal Christian Council for Life and Work, Chamby, Switzerland, August 25, 1936; WHEREAS the Universal Christian Council at its Eisenach meeting in 1929 expressed its desire for a careful study of calendar reform and Easter Stabilization; and WHEREAS the Council in 1932 instituted an intensive study of these subjects by its Research Department; and WHEREAS these studies and reports from the Churches have shown that a reform of the calendar and the stabilization of Easter would, if carried through, receive the support of the overwhelming majority of the Churches, providing it is based upon the perpetual twelve-month equal-quarter plan proposed by the League of Nations:

THEREFORE, be it resolved that the Universal Christian Council instructs its Standing Committee on Calendar Reform, to notify the Secretary General of the League of Nations concerning the above report and to secure the most effective presentation of this action of the Churches at the forthcoming world conference on Calendar Reform and the stabilization of Easter and finally that this Council asks the Churches to inform their respective Governments of this action and of their views with regard to the desirability of adopting the new calendar.

and America. The viewpoint of the Vatican, too, is gradually being clarified—first, by the report of the Cabrol mission sent to Rome from England, and more recently, by the Abbé Chauve-Bertrand's book.

A wide development of interest in calendar reform is also noticed in other directions. Labor has spoken again and convincingly at the Geneva conference of the International Labor Office. Commercial bodies, following the long-standing leadership of the International Chamber of Commerce, have been active, and resolutions have recently come to the League of Nations from influential British groups, including the London Chamber of Commerce, the Association of British Chambers and the Congress of British Empire Chambers.

Scientific and learned associations which have manifested the widest public interest in the enactment include leading organizations of this kind, both in the United States and England.

The reasons which are behind this steadily growing international interest in the prompt enactment of a revised calendar were well expressed in the debate in the House of Lords last March and in the committee hearing before the International Labor Conference in June.

"If the calendar is reformed," said Lord Merthyr, "it would be of some advantage, direct or indirect, to every man, woman and child in the civilized world," and the Archbishop of Canterbury added: "I have found it impossible to resist the plea for reform in this matter which comes, I think it may be said, with practical unanimity from the representatives of all the great organizations of trade, industry and commerce."

The unanimous resolution passed by delegates of 47 nations at the Geneva Labor Conference declares: "It is a well-recognized fact that the present calendar is very unsatisfactory from economic, social and religious standpoints, and that recent studies, investigations and reports have shown a marked trend of opinion in favor of its revision."

Friends of the League of Nations have seen with keen appreciation the interest which the League has taken in calendar reform, because they view it as one of the subjects on which the League may well advance and strengthen, without friction or difficulty, the purpose of its Charter: *"To promote international cooperation and to achieve international peace and security."* Calendar reform, they point out, offers a timely and welcome opportunity for nations to come together without the handicap of national prejudice, political bias or special interest. The subject is one which aims at the common good and general welfare of mankind without discrimination or barrier. The reason and argument for calendar reform are based on the broad foundation that the natural orderliness and harmony of the universe dictate a corresponding symmetry and order in the system of our time-measurement, which is founded on the immutable movements of the earth and the sun. Here an application is found for the noteworthy statement of Dr. Robert Millikan, that the universe is

"of extraordinary and unexpected orderliness and of the wondrous beauty and harmony that go with order" and that there exists "an inter-relatedness, a unity and a oneness about the whole of nature." Or the similar statement of Calvin Coolidge that "the process of civilization consists of the discovery by men of the laws of the universe and of living in harmony with these laws."

A general agreement is being reached among all nations and authorities, as to the type of calendar revision which is required. It should be one in which the laws of the universe are applicable. The 13-month plan has been discarded and the 12-month, equal-quarter plan, known as The World Calendar, which responds more closely to the above-named attributes—law, order, harmony, balance, inter-relatedness, unity and oneness —is accepted as the approved method of revision.

The United States, in the report of the Central Statistical Board, has wisely drawn attention to the urgency of immediate international action for the calling of a treaty-drafting convention, if the world is to have the benefit of an improved calendar within a reasonable time. There are certain stated intervals at which the transition can be effected in an easy and natural way, when both the old and the new calendar coincide by beginning the year on the same day and date—Sunday, January 1, 1939. The same opportunity will not occur again until 1950—eleven years later. If, therefore, action by the League of Nations is not taken within the next few months, it becomes imperative for an individual government to take independent action by calling for the necessary international conference. The proper procedure will then be formulated for the operation of the new calendar in 1939. It is greatly hoped, however, that the League, fully aware of its opportunity, will not permit this chance for international cooperation and agreement to pass by and will do everything in its power to bring the new calendar to fulfillment without further delay.

In the House of Lords, Lord Desborough expressed the ardent wish "that this long-needed reform of the calendar and the stabilization of Easter may be introduced to the great advantage of the world in 1939." And, in the words of the Archbishop of Canterbury: "It would be a real misfortune if this matter were allowed to drift."

MATHEMATICAL DATE-FINDING

By JOHN L. ROBERTS

(From the *Annals of Mathematical Statistics*, March, 1936)

As an example of the intricate and complicated statistical processes which are necessary in connection with the present (Gregorian) calendar, this "simplified" outline prepared by Mr. Roberts for the leading periodical in the field of mathematical statistics, is interesting and instructive. He also shows very clearly the tremendous simplification that will come through The World Calendar.

IF WE wish to find the day of the week for any date, one way to solve the problem is to use a perpetual calendar. Another way to solve the problem is to calculate the day of the week by mathematical methods. In the past these mathematical methods have been so complicated that it has been much more convenient to use a perpetual calendar. This explains why some people have put themselves to the expense of buying perpetual calendars. The purpose of this article is to provide a mathematical method which is so simple that the entire calculation can be done mentally and which is as convenient as a perpetual calendar. In this article this mathematical method is applied to the Gregorian, Julian, and World Calendars. Since a great many records have been made using the Julian and Gregorian calendars, the adoption of The World Calendar would not completely eliminate the usefulness of applying the mathematical method to the historical calendars. The mathematical method also shows to what extent The World Calendar is a simplification; this is important because calendar reform is attracting world-wide attention.

In the theory of numbers occurs the expression,

$$a \equiv b \bmod p, \tag{1}$$

which is read a is congruent to b modulo p, and which means that the difference of a and b is divisible by p. Since p in this article is always equal to 7, it is convenient to represent (1) by

$$a \equiv b. \tag{2}$$

Assume m stands for any number which represents any monthday of any month. Assume w stands for any number which represents any day of the week. It is assumed that 7 stands for Sunday, 1 for Monday, 2 for Tuesday, etc. It is assumed that the constant c for any month is the value of m at the first Sunday in that month. Then (2) becomes

$$w \equiv m - c, \tag{3}$$

which enables us to find w if m is known provided the constant c is known for the month in question. Consequently, all we need to complete our theory is to discover a method of readily finding c for any possible month.

First, there will be discussed rules for finding c for any month of the Gregorian calendar in 1935. An inspection of the calendar shows that c

for December is equal to 1. Since November has 30 days, we can find *c* for it by adding 2, which is congruent to 30, to the *c* for December. Since the number of days in September, October, and November is 91, which is congruent to zero, the *c*'s for September and December have the same value. In like manner, since *c* for September is 1, the *c* for June is 2, and the *c* for March is 3.

We now have all the theory which is necessary to find *w* at any date in 1935. For example, suppose we wish to find *w* for April 17, and know that the *c* for December is 1. Then, by adding 2 we find that the *c* for March is 3. We are now in position easily to calculate that the *c* for April is 7. Applying (3) we find that *w* at April 17 is 3, which stands for Wednesday.

All that is necessary to complete our theory of the Gregorian calendar is to find rules for finding *c* for December of any possible year, because, if this is known, we can find *c* for any month in that year by the method used for 1935. It is convenient to represent the expression "*c* for December 1935" by "*C* for 1935." In like manner *C* for any calendar year means *c* for December of that year. Since *C* for 1935 is 1 and since the number of days in 1936 is 366, which is congruent to 2, subtracting this 2, we find *C* for 1936 is 6, because —1 is congruent to 6. Knowing *C* for 1936, we deduce that *C* for 1940, which is four years later, is 1, because 6 + 2 is congruent to 1; and that *C* for 1928 is 2 found by subtracting 4. The *C*'s for 1900, 1928, 1956, and 1984 are equal. Full centuries in order to be leap years must be divisible by 400. Since *C* for 1900 is 2, we find by adding 1 that *C* for 2000 is 3. Knowing *C* for 2000, we deduce by adding 2 that *C* for 2100 is 5. 1600, 2000, and 2400 have the same value of *C*. If it is assumed that the length of the tropical year is exactly 365.2425 days, we have all the theory which is necessary to find *C* for any possible year. Although this assumption contains a small error, any further discussion of it would hardly be of any practical interest. The foregoing theory provides complete methods for finding *w* by means of a series of steps, which are so simple that the entire calculation can be done mentally. For example, suppose we wish to find *w* for November 29, 1888. Each of the *C*'s for 1800 and 1884 is 7. Therefore *C* for 1888 is 2, which is congruent to 7 + 2. Adding 2, *c*, for November of this year is 4. Applying (3), we find that *w* at November 29, 1888, is 4, which stands for Thursday. In order to calculate mentally *w* for any date of the Gregorian calendar, it is only necessary for me to remember the foregoing mathematical method and to remember I was born on November 29, 1888, a Thanksgiving Day.

Deplorable changes were made in the Julian calendar between 45 B.C. and 1 A.D. Also it was not until 325 A.D. that the use of the 7-day week became general throughout the Roman Empire, gradually supplanting the old division of the month into Calends, Nones, and Ides. Therefore, in order to save space, the application of our theory prior to 1 A.D. is left to the reader. Starting with this year it is only necessary to discover a rule for finding the *C*'s of the Julian calendar for the full centuries, because the rules of the Gregorian calendar apply to all other years. October 5, 1582, Old Style was the same day as October 15, 1582, New Style; the Gregorian calendar was born at this date. December 17, 1600, New Style was a Sunday, and was the same day as December 7, 1600, Old Style. Therefore, *C* for 1600, Old Style is 7. It is now a very simple matter to complete our theory of the Julian calendar. Since *C* for 1600 is 7, subtracting 1, *C* for 1500 is 6. 200, 900, and 1600 have the same value of *C*.

In the case of The World Calendar the *c*'s for the three months of each of the equal quarters can be found as follows. For the first month *c* is 1. Therefore, *c* for the second month is 5, which is congruent to 1 — 3. Subtracting 2 from this 5, we find that *c* for the third month is 3.

EDITOR'S NOTE: Thus the first Sunday in the first month is January 1; the first Sunday in the second month is February 5; and the first Sunday in the third month is March 3, the numbers being 1 and 5 and 3. This same system, used in relation to all the other week-days, is repeated every quarter continuing on indefinitely.

HAVE YOU HEARD?

By MARGUERITE BAIR FELBER

U. S. Office of Education, Washington.

A radio series under the title "Have You Heard?" is broadcast every Tuesday afternoon over the Blue Network of the National Broadcasting Co. The scripts are written by Mrs. Felber of the government's Office of Education. The following script, published in full with all the technical directions for music and actors, was produced on August 4. It is a popular discussion of Time and Calendar Reform, and in its dramatized form may prove useful to many readers as a basis for other broadcasts.

MUSIC: (WEIRD MYSTERIOSO FANFARE)

ANNOUNCER: Have You Heard!

MUSIC: (THEME . . . FADING FOR)

ANNOUNCER: This is your invitation to visit another fascinating corner of the world of natural science. Ladies and gentlemen—your Friendly Guide!

MUSIC: "OH! IT'S NICE TO GET UP IN THE MORNING" (CHORUS)

SOUND: (ON THE LAST NOTE OF SONG—RINGING ALARM CLOCK)

GIRL: Ohhh (SLEEPY AND PROVOKED)—there goes that alarm again!

SOUND: (SPITEFULLY STOPS ALARM . . . KNOCKS OVER CLOCK)

GUIDE: (FADE IN, CHUCKLING) Good afternoon, friends. That was a typical early morning scene, but really, now, this young lady shouldn't complain—she ought to be thankful she's living now—and not back when the world was created—because *then* the nights were only one hour long!

GIRL: That reminds me! Last week you said that days used to be only two hours long instead of twenty-four, and you promised to explain today.

GUIDE: I'll be glad to. Of course, you know that the length of a day is determined by the time it takes the earth to make one complete rotation.

GIRL: Of course.

GUIDE: Well, when the earth was first flung into space——

GIRL: (INTERRUPTS) Did you say the earth was flung into space?

GUIDE: Yes . . .

GIRL: Oh—please! Where was it flung from? And how?

GUIDE: I'll tell you all about it next week.

GIRL: But I want to know now!

GUIDE: I thought you wanted to hear about the time when days were only two hours long?

GIRL: I do. I'm sorry—I won't interrupt again. But I'll certainly be looking forward to next week!

GUIDE: (AMUSED) I'm glad to hear it. Now, as I was saying, when the earth was first flung into space it spun around on its axis once every two hours instead of once in every twenty-four—as it does today.

GIRL: So that's why the days were two hours long!

GUIDE: Yes. The period of darkness—or night—lasted only one hour at the equator—and was even shorter in other parts of the world.

GIRL: What caused the earth to slow down to its present rotary speed?

GUIDE: Don't you remember what I told you some time ago about the moon, and how its tidal pull caused the earth's speed to decrease?

GIRL: Oh, yes! That's right. Tides act as a brake and slow down rotation. (BRIGHTLY) Then some day we'll have even longer days and nights than we have now!

GUIDE: Yes.

GIRL: At least that's something to look forward to!

GUIDE: (LAUGHING) Yes—if you live long enough! Of course, the change is very gradual, amounting to only about one minute in six million years. But if you're that anxious to have longer days and nights why don't you move to the North or South Pole where they have six months of daylight and six months of darkness?

GIRL: Then the length of day and night is not the same the world over?

GUIDE: By no means! The length of day and night in different parts of the earth varies with the distance from the equator.

GIRL: I suppose I ought to know why that is, but somehow——

GUIDE: Because of the unequal distribution of sunlight over the earth's surface, which is mostly due to the motion of the earth around the sun, and the earth's inclination on its axis.

GIRL: Oh-h-h . . .

GUIDE: For instance, at the equator the day is always twelve hours long and so is the night, but the poles have a six-months day and a six-months night. Between these two extremes the days and nights vary in length.

GIRL: (LAUGHING) That's enough to daze anyone!

GUIDE: It certainly is! As a matter of fact ever since ancient times the inhabitants of the earth have been kept in a sort of daze in their attempts to devise suitable calendars and accurate methods of time keeping.

GIRL: You know, I never thought about it before—just took calendars and clocks for granted . . . but now that you've mentioned it, I realize that I know nothing at all about how time is determined.

GUIDE: Would you like to hear about it?

GIRL: I should say I would!

GUIDE: All right. We'll begin with Genesis 1, 14, which reads: "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days and for years."

GIRL: I remember that—but what do the stars and the sun have to do with calendars and time keeping—aside from the fact that the sun causes day and night?

GUIDE: Our calendars and our time keeping are based upon the movements of the sun, the stars, the moon and the earth!

GIRL: How?

GUIDE: Suppose we start with the calendar, which divides a year into months, weeks, days, hours, minutes, and seconds. There is a natural day, month, and year—but weeks, hours, minutes, and seconds are artificial units.

GIRL: I don't understand!

GUIDE: You will in a moment; because it is really very simple. Just remember that the earth spins around and around on its axis, and at the same time revolves around the sun. Like a spinning top traveling around in a big oval circle with a ball in the center of the circle to represent the sun.

GIRL: I can just see it!

GUIDE: Well, the spinning on its own axis we call "rotating." The earth rotates, or turns around once every twenty-four hours. That makes a day. But it takes 365 days and a fraction to revolve around the sun—so that makes our year.

GIRL: Oh . . . of course. But what about a month!

GUIDE: A month is the length of time it takes the moon to revolve about the earth. That's where the "month" gets its name—from the moon.

GIRL: Well—of all things!

GUIDE: The first method of keeping track of time was originated by the early Chaldeans.

GIRL: They're in the Bible. They lived four or five thousand years before the time of Christ.

GUIDE: Nevertheless—they had a calendar.

GIRL: Was it like ours?

GUIDE: No, it was much different. These ancient people were very much interested in the different phases through which the moon passed because many of their religious rites were associated with the moon.

GIRL: How interesting!

GUIDE: Each time a new moon appeared the priests would greet it with prolonged trumpet blasts—announcing to the population that a new month had begun.

GIRL: Well! Imagine that!

GUIDE: It is believed that the week had its origin in these religious festivals.

GIRL: How?

GUIDE: Because these early Chaldeans were so interested in the phases through which the moon passed, and although they kept time by the month, their calendar was divided into seven-day periods.

GIRL: (SURPRISED) Oh, was it?

GUIDE: Yes. We have had a seven-day week ever since, so doesn't it seem plausible to you that the Chaldeans, after observing that the moon went through four phases in a month, concluded that the month should be divided into four parts?

GIRL: It does sound reasonable.

GUIDE: It might interest you also to know how the days of the week got their names.

GIRL: Yes! I've often wondered about that.

GUIDE: They were named after what were known as the seven wandering stars; Sunday for the sun—sun-day. Monday for the moon, moon-day, or Monday. Tuesday after Tues—the Anglo-Saxon name for Mars. Wednesday after Woden—the Anglo-Saxon for Mercury. Thursday after Thor, meaning Jupiter. Friday after Friga, meaning Venus, and Saturday after Saturn.

GIRL: I never knew that before! Now the days of the week will mean something to me.

GUIDE: That's good.

GIRL: How did the Chaldean method of time-keeping come down to us?

GUIDE: Knowledge of it was carried from Chaldea to Alexandria, Egypt; from Egypt to Athens, and from Greece to Rome. It was the only method of time-keeping the earlier Romans ever used, and it continued in use until the time of Julius Caesar, about 45 B.C.

GIRL: What happened then?

GUIDE: By that time the calendar had gotten into great confusion.

GIRL: Why?

GUIDE: Since the moon goes through its cycles about thirteen times in the same length of time that it takes the earth to go around the sun, there should have been

almost thirteen months per year, but since there are not exactly thirteen months, if you keep time by the moon, very soon the seasons will not come out right, and that is just what happened.

GIRL: That's right—the seasons *would* get mixed up!

GUIDE: In order to correct this difficulty they had been using an "intercalary month"—"intercalary" means "between the calendar"—and they just inserted an extra month in the calendar whenever it was considered necessary—just as we have leap year.

GIRL: (LAUGHING) Well! At least then the girls in those days were lucky!

GUIDE: Why, what do you mean?

GIRL: They could have leap year every year.

GUIDE: (LAUGHING) Perhaps that was one of the things that caused the confusion. Anyway—in those days there were some sly fellows who discovered that by deliberately juggling the calendar and adding months—even when they weren't needed, they could lengthen their terms of office or add to the number of revenue payments they could receive.

GIRL: (LAUGHING) Imagine that! So they even had tricksters in those days!

GUIDE: Oh, my yes! But when Julius Caesar came into power he decided to right this inconvenient state of affairs.

GIRL: What did he do about it?

GUIDE: He sought the aid of the Egyptian astronomer, Sosigenes, and set to work revamping the calendar.

GIRL: Did they change it much?

GUIDE: So much that by the time they were through they had a brand new calendar!

GIRL: (AMAZED) What!

GUIDE: First of all, Caesar decided to ignore the phases of the moon and to base the calendar upon the length of time it takes the earth to make one complete revolution around the sun, about 365¼ days, and this period of time was called a year.

GIRL: Then he didn't divide the year into months?

GUIDE: Oh, yes—but he increased the number of days in them so that their total would equal the number of days in the year. Then he decided that January first should be New Year's Day.

GIRL: Why—wasn't January first *always* the beginning of the new year?

GUIDE: Oh, no! New Year's Day used to be on March first. March was the first month of the year up until that time, and December, taken from the Latin numeral, ten, was the tenth. January and February were the eleventh and twelfth months.

GIRL: Well—of all things!

GUIDE: Most of the old names of the months were retained, but Caesar changed the name of Quintilis, which had until that time been the fifth month of the year, to July after himself to commemorate the revision, and later, Sextilis, which once was the sixth month, was changed to August by Augustus Caesar.

GIRL: . . . (LAUGHING) And the good, the noble Caesar did, lived after him!

GUIDE: And no wonder! For the Julian Calendar was a great improvement over the old style method of time-keeping, and remained in effect for many years. It was not until the sixteenth century that any change was necessary.

GIRL: What was wrong this time?

GUIDE: The Julian Calendar was based on a year containing 365¼ days. In order to take care of the fraction every fourth year an extra day was added to the month of February.

GIRL: Then that's how leap year originated?

GUIDE: Yes. But with all its improvements the Julian Calendar was not accurate, and the error amounted to one whole day in 128 years, so that by the sixteenth century the seasons were again out of line and the first day of spring, or the vernal equinox, had worked forward to March 11th instead of coming on the 21st as it should.

GIRL: But why should that happen when a leap year was used?

GUIDE: The reason is that the tropical year, that is, the year of the seasons,

reckoned from equinox to equinox, is not exactly 365¼ days, but is actually 365 days, 5 hours, 48 minutes and 46 seconds in length.

GIRL: (LAUGHS . . . THEN) How did they come to revise the calendar this time?

GUIDE: Pope Gregory XIII was interested in the calendar because, in those days, back in 1582, time was in the keeping of the Church. He decided to revise the calendar because some of the religious festivals were gradually changing with respect to the seasons.

GIRL: You mean days like Easter Sunday?

GUIDE: Yes—that's a very good example. Way back in 325 A.D. Easter Sunday was designated as the first Sunday following the first full moon, following the Vernal Equinox, and at that time the date of the equinox was March 21.

GIRL: How is the date of Easter determined now?

GUIDE: The same way—the first Sunday after the first full moon, following the Vernal Equinox. It's been done that way ever since 325 A.D.!

GIRL: Well! I didn't know *that* before.

GUIDE: When the seasons got out of line Pope Gregory ordered that ten days be dropped from the calendar to bring the date of the Vernal Equinox back to March 21, and in order to keep it there he amended the Julian rule for leap year so that February would have 29 days on every year that is divisible by 4, except the century years that are *not* divisible by 400. Consequently the years 1700, 1800, and 1900, although divisible by 4, were *not* leap years.

GIRL: Are we still using the Gregorian calendar?

GUIDE: The Gregorian calendar was adopted in Roman Catholic countries in 1582, but it was not until 1752 that the British Parliament finally voted to adopt it. After that it was generally accepted and has been used ever since.

GIRL: I hope they don't change the calendar any more—I'm afraid I'd get all mixed up in my dates.

GUIDE: Then you should have been around when the Gregorian calendar was first adopted in Great Britain.

GIRL: What happened?

GUIDE: England had never accepted the Julian Calendar, and so when Parliament decreed that eleven days should be omitted between September 2 and 14, and that the beginning of the year should be moved from March 25 to January 1 there was general rioting on the part of the populace and the people claimed that they were being robbed of that much time.

GIRL: I can't say that I blame them much—that must have changed the dates for everything.

GUIDE: It did! And there was considerable confusion for some time, but the dates were eventually adjusted. For instance, have you heard that George Washington was born on February 11?

GIRL: I thought it was February 22.

GUIDE: It is according to the new calendar. George Washington was born on February 11, 1732, but when eleven days were omitted from the calendar in 1752, his birthdate became February 22.

GIRL: What do you think of that?

GUIDE: I think that even though the error in the Gregorian system will amount to only one day in about 30 centuries or about half an hour in an ordinary lifetime, it is still not entirely satisfactory.

GIRL: Why not?

GUIDE: Because the months range in length from 28 to 31 days; the number of business days in any month varies; there may be either 4 or 5 Sundays in a month, Easter may fall on any date between March 22 and April 25, and in addition to all these things an error still exists in it.

GIRL: You don't think they will change it again though, do you?

GUIDE: They might! Two excellent new arrangements have recently been discussed.

GIRL: By whom?

GUIDE: A committee appointed by the League of Nations to consider revision of the calendar.

GIRL: What are these two plans?

GUIDE: One arrangement has twelve months and makes the first month in every quarter 31 days long. All the other months would have 30 days each, making a total of 364 days or 52 weeks in the year.

GIRL: But then the year would not have enough days . . .

GUIDE: Oh, they have taken care of that. You see the 365th day would be called Year-End Day, and would not be counted in any week or in any month.

GIRL: But what would they do about leap year?

GUIDE: On leap year the extra day would be inserted before July 1. With such a calendar each quarter of the year would have exactly 91 days, beginning on a Sunday and ending on a Saturday, exactly the same for each year, and Easter would always come on the same date.

GIRL: It would be a drastic change, wouldn't it?

GUIDE: Yes—but probably a very convenient one.

GIRL: What is the other plan?

GUIDE: The second plan divides the year into thirteen months of 28 days or four weeks each. Year Day and Leap Day would be extra days and every month would be exactly like every other month.

GIRL: It sounds monotonous to me—I like variety.

GUIDE: (CHUCKLING) Anyway, we always have had and always will have time on our hands—no matter how we divide it.

MUSIC: "TIME ON MY HANDS."

GUIDE: Have you heard that although no one on earth has ever been able to go to a star, some scientists claim that living things from the stars have come to our earth?

GIRL: Do you mean living things from away out in space?

GUIDE: Yes!

GIRL: But how could that possibly happen?

GUIDE: I'll tell you next week.

MUSIC: (THEME . . . UP AND FADE)

ANNOUNCER: Tune in next week, same time, same station, for another presentation of "Have You Heard?" In closing we are pleased to announce that there is now available for free distribution an interesting leaflet entitled, "Curious Facts About the Calendar." This leaflet contains many facts of interest about the development of our calendar through the ages, as well as a summary of the information presented today. You may have it free by sending your name and address to "Have You Heard?" Office of Education, Washington, D. C.

CHINA FOR THE WORLD CALENDAR

DR. TSAI YUAN-PEI, President of the Chinese Government's National Academy in Nanking, has notified The World Calendar Association that China has officially approved of the international proposals for a revision of the calendar according to the 12-month equal-quarter plan. This is the result of a protracted study by a Chinese National Committee including representatives of the Ministries of Foreign Affairs, Railways, Finance, Communications, Industries and the Interior, with an additional representative from the National Research Institute of Astronomy, Dr. C. S. Yu.

"Questionnaires were distributed," writes Dr. Tsai Yuan-pei, "which effectively brought forth opinions from various walks of life regarding the desirability of the proposed change, and the type of revised calendar which would be most suitable to China. The consensus of opinion was favorable to calendar reform and overwhelmingly endorsed the 12-month plan as against the 13-month proposal. The 13-month scheme does not seem to appeal to the Chinese people."

OBJECT LESSON IN DATES

By WADE POSTON, JR.

Monday's child is fair of face;
Tuesday's child is full of grace;
Wednesday's child is loving and giving;
Thursday's child works hard for its living:
Friday's child is full of woe;
Saturday's child has far to go;
But the child that's born on the Sabbath day
Is blithe and bonny and good and gay.

WHICH are you? Are you "Fair of face"? "Full of grace"? "Blithe and bonny"? Or are you "stumped"? In other words, do you know the day of the week on which you were born? Please don't feel ashamed to admit it. You are one of a large human majority.

Now don't run to the nearest almanac. In a few more sentences, we're going to show you something interesting—a method by which you can calculate the day of the week for any date in the past or future, in the present Gregorian Calendar.

True, as you can see by glancing at the bottom of this page, the calculations involve a great deal of trouble. But long use has accustomed you to most of our present calendar's complexities. Surely you will not mind a few more!

Let us suppose, for instance, that your birthdate is September 15, 1911. You wish to find out the weekday on which you were born. Here's how:

Set down the last two figures of the year:	11
Add one-fourth of the same number, disregarding any remainder. One-fourth of 11 is:	2
Add the day of the month:	15
Add a certain figure, depending on the month, as shown in the foot-note table.* We'll call it a "ratio," and the ratio for September is:	6
The total is:	34
Divide by seven. (Seven days in a week.)	
34 by 7 is:	4 and 6 remainder

The remainder (6) indicates the day of the week for this particular date. That is, September 15, 1911, fell on the sixth day of the week, or Friday. In a like manner, Sunday would have been indicated by a remainder of 1, Monday by 2, etc. An even division, without remainder, indicates Saturday.

This formula is applicable to any date in the twentieth century—from 1900 to 1999. For a date in the nineteenth century, add 2 to your column before dividing. For the years between 1752 and 1799, add 4. Prior to

*The *ratio* for the various months is as follows: April or July, 0; January or October, 1; May, 2; August, 3; February, March or November, 4; June, 5; September or December, 6. In Leap Years, January, 0; February, 3.

the year 1752, the Julian Calendar was in use, a system that was anywhere from one to eleven days late.

Going into the future: For the years 2000 to 2099, add 6. Anything beyond that latter date probably doesn't interest you; but, if you have any use for it, the number for the next century—2100 to 2199—is 5.

Try your hand at it. What will be the date (weekday) of the fourth of July, 1939? Go ahead, work it out.

Tuesday? Sorry, you're wrong! The fourth of July, 1939, will come on a Wednesday. But before you start checking over your figures, a word of explanation. You have *not* erred in your calculations. But you *have* overlooked the revised World Calendar, a new timing system, favored for adoption in 1939.

The World Calendar is the final development of a wide series of calendar reform movements which have sprung up during the last century. In the opinion of most leading nations, this plan is the logical successor to the unbalanced, inconvenient Gregorian Calendar which is now in use. In fact, there is only one other important contender for the place, a system known as the 13-month plan.

This second movement, more radical of the two, has an extremely precision-like year of 13 months, each month beginning on Sunday and containing exactly four weeks. Since this type of arrangement would provide only 364 days, an extra day, following the last of December, would be added to round out the year. The advantages of the 13-Month Calendar lie principally in its precision sameness—its unvarying similitude of week, month and year. Its disadvantages are quite as real.

Imagine, if you can, a clock with thirteen hours. Now quickly answer the following questions: At what time is the day half over? A quarter over? Three-quarters? A third?

Some job! And in a year of 13 months, we find the same difficulties. The year would be half over on the fourteenth of Sol; a quarter over on the seventh of April; a third over on May 10. Think of the melee such an arrangement would cause, especially in business circles, where much accounting is done on a quarterly, not a monthly basis. Think of the resultant confusion in readjusting leases, rents, and insurance. And the trouble that would be caused in celebrating national, religious, and personal holidays if an extra month were added to the calendar!

On the other hand, the revised World Calendar offers practically all the advantages of the 13-month system, without any of its handicaps. Under this plan, the familiar year of twelve parts would be retained, but a few small changes would be made in the lengths of the individual months. For instance, February, long the outstanding eyesore of the Gregorian Calendar, would be brought up to a standard of 30 days. This, together with the addition of an extra "rounding-out" day at the end of December,

would permit all quarters of the year to be made equal. Each quarter would contain exactly 91 days. Each would coincide with the beginning of one of the months; hence, there would be no confusing "splits" for accountants to overcome.

Farmers, too, would appreciate the even-quarter plan, since it would mean accurate seasonal dating. Under a 13-month system, the seasons would begin, approximately on March 24, Sol 4, September 14 and December 19, supposing the extra month to be inserted between June and July. With The World Calendar, however, regular quarterly divisions would stabilize the seasons at the same monthly date for the entire year. This is of obvious advantage in farm reckonings.

In the past, many persons have been wary of calendar reform, since they believed that Christian churches, in general, looked upon it with disfavor. Nothing could be farther from the truth. Out of 1178 replies to a questionnaire, from clergymen of all denominations, 90 per cent enthusiastically supported the proposed reform of the calendar. Then again, repeatedly in this journal there have appeared the articles and statements of eminent religious leaders, all of whom favor a revised dating system. In behalf of the Roman Catholic Church, the Vatican has declared that there are no doctrinal reasons why the change should not be effected. The Universal Christian Council of Geneva, too, after conducting a survey of non-Roman churches, reported that the overwhelming majority of the churches favor not only stabilization of Easter, but also general calendar reform, eventually of necessity to be connected with Easter stabilization.

Very definite action was taken by the Episcopal Church at its convention in Atlantic City, where the assembled members adopted a resolution specifically approving The World Calendar. The Eastern Orthodox Church, too, is an outstanding proponent of reform. It fully appreciates the perplexities of our present system, as it is just now revising its religious holidays from the Julian to the Gregorian Calendar.

It is hard to conceive of a trade or profession in which the 12-month revised calendar would not be of benefit. What is *your* position in life? Are you a merchant? Then your sales statistics are accurately equalized four times a year. Are you a teacher? Then your class schedule needs to be made only once, not annually. Are you a landlord? Then you will appreciate the fact that half-yearly contracts run for 182 days, not for either 181 or 184. Are you a clergyman? Then you will enjoy the benefits of a fixed Easter.

All businesses and occupations are integrally bound to the calendar. An improvement in the calendar is an improvement in business facility and in the still more important business of living.

ROMANCE OF THE CALENDAR

By P. W. Wilson

CHAPTER SIX: MOON AND MONTH

IN READING the riddles that lend mystery to the romance of the calendar, we cannot but be impressed—possibly amused—by a perpetual paradox. On the one hand, the pages of record are inscribed with human traditions, customs, memories that are quaint as the ornament on a mediaeval manuscript. On the other hand, the astronomer imprints upon every paragraph the minutiae of the strictest mathematics. There is sentiment playing like summer lightning around the solid structure of cold and unemotional science.

Gazing upon the moon, we are entertained especially by this charming —even grotesque—inconsequence. There are puerile absurdities that distract the attention. Yet the absurdities are as a fitful floodlight that reveals age-long exactitudes at which we can only be silent in astonished awe. Any comment would be inadequate to a miracle thus majestic.

On any given evening, how many of us could say off hand where, if anywhere, we would look for the moon? Never is Diana to be discovered save where and when she wants to be. Among the myriad suns and their satellites that waltz around one another in the glittering court of the celestial kingdom, this "Queen and Huntress, chaste and fair"—has been the most wayward in her bewitching of the imagination.

The sun is regular in his habits. He rises above the horizon, and it is below the horizon that he sets. But the moon! It is only by accident that she rises and sets. Here is a fairy godmother who, more often than not, suddenly appears in mid-sky—emerging in her glorious sheen from nowhere, vanishing into nowhere, and for no reason that is obvious to the onlooker. According to what seems to be her own sweet will, the moon thus changes her aspect and position from day to day, entering on the scene without warning as a crescent, waxing into full orb, waning into a contrary crescent and thus fading away into a fathomless infinity.

A little research is enough to demonstrate that the moon obeys the laws of motion. Despite all impious and impish insults against "the sacred queen of night," her arrows, as she aims them, never fail to hit the mark. For the moods of the moon, there is a precise explanation. The rhythm of her dance is absolute in its ascertained punctualities. She swerves, she sways, but only according to that universal gravitation which is the music of the spheres.

If the Romans described the moon as *luna*, it was in admiration. The word *luna* is a colloquial form of *lucna* and is associated with *lucere*, to

shine—indeed, with *light* itself. The moon is the orb that illuminates.

The word *moon,* with which we make so free, is found in the original vocabulary by which man first expressed his thought in language. *Moon* is akin to the Aryan *Maonh* and therefore to the Sanskrit *mas,* the Greek *men,* the Irish *mi,* the German *mond,* the Dutch *maan,* the Danish *maane* and the Mexican *metzle.* The derivative word *month* appears in Latin as *mensis.* In one form or another, the word *moon* is universal.

To a student of the calendar, the root of the word is full of significance. It is *me* as found in the first syllable of measure—the moon is thus the measurer of the month, and the phases of the moon have furnished the most obvious—therefore, the earliest—of all known standards by which time has been calculated. Without an exception, it seems as if the primeval calendars were lunar in origin, and some of them—for instance, the Hebrew and the Mohammedan—are lunar to this day. The emblem of old Turkey was a crescent moon with a planet within its horns.

It is the moon as a measurer that here demands our attention, and how shall we explain its function? We say that the moon moves around the earth and, in a sense, so it does. Yet its wanderings are not quite so simple as that. Perhaps we may best understand the motion by thinking of a merry-go-round at a village festival. Some of these arrangements for indulging in the genialities of giddiness are fitted with small circular cars which revolve on their own axis while that axis is swept around the central pillar. Let us suppose that the pillar is the sun, that the axis is the earth and that the passenger on the rim of the car is the man in the moon. Then let us watch what happens.

As he swings around, the passenger looks steadily towards the axis of the car, and so does the man in the moon. He is always gazing at the earth. From time to time, we may see a little more of one ear and a little less of the other. But not for an instant does this rude fellow, as he stares at mankind, allow us to catch a glimpse of the back of his head. The world sees half the moon, but the moon sees all the world.

The world is still a smouldering cinder that sometimes emits a spark—what we call a volcanic eruption. The moon is dead and cold and white as a ball of ivory. It has no fires within itself, but is a placid reflector of fires elsewhere, and this is the simple circumstance that explains the behavior of the moon which evoked so much irreverence among our forefathers. The man in the moon can only be seen when he is illuminated by the sun and even so he can only be clearly seen by those whose eyes are shaded from the sun. Hence his appearances and disappearances when soaring in mid-heaven above our heads.

A month may be defined as the period within which the moon completes his regular performance; and most of us define a month as the time that it takes the moon to "go round the earth." There are, however, complications.

If the earth were standing still and the moon were revolving around the earth like a speck of dust on the rim of a wheel, a month would be just over 27 days 8 hours. Even so this month varies slightly according to the method of calculation. There is the sidereal month (27.32166 days) based on the relation between the earth, the moon and the far distant stars. It is virtually the same as the tropical month (27.32156 days) based on the equinox. The anomalistic month is slightly longer (27.55455 days). It is the period that elapses between what is called perigee and perigee—which term simply means the moments when the moon, in its slightly elliptical orbit, is nearest the earth. Another month is known as nodal or diaconic (27.21222 days), and this month is a little more delicately adjusted. The orbit of the moon is in one plane. The orbit of the earth is in another plane. Where these planes intersect, there is a straight line pointing to the nodes, and the nodal month is reckoned relatively to this line.

All of these months are important to the astronomer. None of them concern us in our study of the earlier calendars. What primeval man noticed was the new moon. The question that he asked was how long a period of time elapsed before there was another new moon. In his elementary way, he was thus calculating what we call the synodic month and in this month, obviously, we must include the sun that lights up the new moon. Let us see how it works out.

It is not so very difficult to understand the synodic month if we give our minds to it. Let us take a moment when (1) the central pillar of our merry-go-round, that is, the sun, (2) the axis of the revolving car, that is, the earth, and (3) the man on the rim of the car, that is, the moon, are in the same plane—with the man on the outer edge of the merry-go-round. Then let us watch until the three of them are again in exactly the same relative positions—that is the central pillar (the sun) the axis of the car (the earth) and the man on the outer edge (the moon)—all of them in the same line as before. If we reckon up the interval that has elapsed between these two alignments, we shall find it has been 29.53059 days—that is 29 days, 12 hours, 44 minutes 29 seconds. This is the synodic month with which we are concerned in our study of the calendar.

The synodic month is about 2 days longer than the other months, and for this difference there is a reason. The moon proceeds on its minor orbit. But the earth also moves on its major orbit. The moon has thus to traverse more than 360 degrees around the world before it reaches a point of alignment with the sun. It takes the moon the extra two days—as it were—to catch up with the advance of the earth.

The motion of the moon is thus ascertained to the fraction of a split second, and we may dismiss from our minds, therefore, any idea that the lunar month, found in so many old calendars, was ever speculative or inaccurate. It was for no such reason, as we shall see, that, in the most

widely used of the calendars, it became obsolete. The moon, if carefully observed, is as perfect a measurer of time as its name implies. If the calendar is to be based upon a period of 29½ days as unit, the moon provides precisely the yardstick that is needed.

It is not only on the exactitude of the lunar month that the prerogative of the moon as measurer of time is based. The chronologist, working in partnership with the astronomer, has extended the range of lunar measurement over thousands of years and has applied the time-table to the perspectives even of primitive history itself. In the determination of dates, he has found that the moon is indispensable. She supplies the historian with a metronome.

It is by a familiar comparison with the game of golf—that we can best appreciate these abstrusities. On the putting green, it is customary to describe a distressing situation as a "stymie." In the middle of the green there is the hole towards which the balls are played. But as luck has it, one ball lies in direct line between the hole and the other ball, so interfering with the desired putt.

The solar system is like a vast putting green where the sun serves as the hole and bodies moving around the sun are sometimes stymied. When the earth passes between the sun and the moon or when the moon passes between the earth and the sun, it is what we call an eclipse, and in the measurement of time eclipses are as the striking of the hours.

If the orbit of the earth were in the same plane as the orbit of the moon, there would be, obviously, two eclipses visible every month. First, the moon would pass between the sun and the earth and secondly the earth would pass between the moon and the sun. Eclipses would thus attract as little attention as the other phases of the moon. They would be accepted as astronomical routine.

In fact, the plane of the moon's orbit is tilted at an angle of about 5 degrees compared with the plane of the earth's orbit, and owing to this tilt the moon and the earth play at what we may call hide-and-seek—avoiding one another's shadows with elusive ease. It is only now and then that they get in each other's way. If the moon obscures the sun, it is a solar eclipse. If the earth obscures the sun and throws the moon into shadow, it is a lunar eclipse. Solar and lunar eclipses may be total or partial, and they are visible in particular and predictable regions. Solar eclipses are seen in the daytime—lunar eclipses are seen at night.

These are the occasions that the chronologist is careful to note and he finds that eclipses run in cycles which are so exact as to be retrospective over the past and prospective over the future. The eclipses themselves occur in space. There is also the question in what regions of the earth a particular eclipse is visible and this depends on the earth's revolution on its axis. The visibility of eclipses, past and present, has been charted for

thousands of years and the results, carrying the memory of man back to the remotest antiquity, are amazing in their certitude. A few out of many examples will illustrate this triumph of the lunar chronology.

In B. C. 213, the Emperor Chin ordered the books of China to be burned. Of the lost archives, there are, however, traces still extant and we have the interesting record that, about 39 centuries ago, the king, Chung K'ang, ordered the Marquis of Yin to march an army against Hsi and Ho, the hereditary astronomers who, indulging in drink, had failed to foretell an eclipse. Without a word of warning from these delinquent scientists, "the sun and moon did not meet harmoniously" and His Majesty was taken by surprise at the sudden omen. The duty of studying eclipses was thus regarded as sufficient to provide a *casus belli.*

The Shih King or Book of Poetry mentions an eclipse of the moon followed by an eclipse of the sun. The allusion points to the year 776 B. C.—twenty-seven centuries ago—when there was a lunar eclipse on August 21 and a solar eclipse on September 6.

In the Book of Amos, we read: "and it shall come to pass in that day, saith the Lord God, that I will cause the sun to go down at noon, and I will darken the earth in a clear day."

This eclipse has been identified. In Assyrian records we read of "insurrection in the City of Assur. In the month Swan, the sun was eclipsed." The year was 763-2 B. C. and on June 15th the eclipse occurred.

In the Odyssey, Homer tells how Ulysses, after his wanderings, returned home and, in fury, slew the rapacious suitors of his wife, Penelope. "The sun," we read, "has perished out of heaven and an evil mist has spread over all." On April 16th, 1178 B. C. there was a solar eclipse which was total around Ithaca where Ulysses lived. Can it be that the legend is vindicated by lunar evidence?

Apparently the poet Archilochus alludes to a total eclipse of the sun on April 6th, 648 B. C. Pindar mentions a solar eclipse which was nearly total at Thebes on April 30th, 463 B. C. Herodotus, describing a battle between the Lydians and the Medes, tells of a total eclipse of the sun on May 28th, 585 B. C. Many other examples of such ancient eclipses could be given. Thus abundantly has the moon—so wayward in her wanderings—justified her prestige as the original and universal measurer of time.

CENTRAL COMMITTEE ON CALENDAR REFORM

ORGANIZATION is announced at Geneva of an "International Committee of Cooperation" on Calendar Reform, with offices at 3 Rue Butini, near the League of Nations' headquarters. The Committee will act as a liaison body between the 25 national committees on calendar reform and the official bodies concerned with this matter, including the League of Nations, the International Labor Office and the various governments. The central Committee is under the chairmanship of the President of The World Calendar Association, with the following vice-chairmen: Rt. Hon. Lord Desborough, England; S. E. M. Alfredo de Castro, vice-president of the League of Nations Advisory and Technical Committee for Communications and Transit; S. E. M. Gonzalo Zaldumbide member of the Council of the League of Nations; Senator C. Mertens, Belgium; Archbishop Germanos of the Eastern Orthodox Church; Bishop William T. Manning of New York; Professor Carlo Ferri, vice-rector of the University of Pavia, Italy; Abbé Chauve-Bertrand of France; Professor A. Keller of Switzerland; Senator Justin Godart, France; S. E. Fernando Garcia Oldini, Chile. The Secretary-General of the International Committee is M. Raymond Mage of Geneva. An Advisory Board includes calendar authorities of Great Britain, France, Canada, South America, Spain and the United States.

EXCERPTS AND REVIEWS

What's Wrong and Why?

By E. B. MERRILL

(From the *Canadian Forum*, Toronto)

WHEN calendar revision is mentioned, most people will ask: Why? What is wrong with the calendar? When we start to consider it, however, we soon realize that it is really a deplorable mess. We have months of 28 to 31 days without regularity of sequence; quarters of 90 to 92 days; half-years of 181 to 184 days; 24 to 27 work-days per month, without considering holidays; the period from New Year to Easter varying by 35 days; this year not like the last nor the next; our dates continually changing to different days of the week from year to year.

These are faults due either to exigencies of calendar evolution or merely to caprice. Our calendar is one of the things that a conspiracy of perpetuating influences has managed to survive in obvious error for some 2000 years, with only small corrections. The longer it has run the more difficult it has become to make a complete revision.

The Romans gave us a perpetual if somewhat irregular calendar—each year like the last, excepting for leap-year day. But that was because there was then no 7-day week in Rome. The 7-day week came more than three centuries later. And when the week came into the calendar, no attempt was made to adjust it to the year, to keep the calendar perpetual.

It has taken us all these centuries to realize that a regular, perpetual calendar is highly desirable and quite possible, depending only on the acceptance of one fundamental device—the creation of one or two 8-day weeks. This is the key to the problem. The rest is simple. And this device has been generally accepted by those who have considered the alternatives.

To have our calendar perpetual we must have an exact number of weeks. Now, 364 days are exactly 52 7-day weeks. Placing an extra day in one of these gives us our normal 365-day year and an additional day in another week gives us leap-year. All future corrections whatsoever would be taken care of by inserting or omitting this second day. With the 52-week year divided into months and quarters, the next 52 weeks will have the same arrangement of weeks, months and quarters—a perpetual calendar.

Thus we have what is generally known as the "World Calendar," which now appears to be favored by some of the leading countries. Its regularity and simplicity are appealing and there is a minimum of disturbance in the transition from old to new systems.

Simple and Clear

By DR. ALBRECHT PENCK

Emeritus Professor of Geography, University of Berlin

(From *Deutsche Allgemeine Zeitung*, Berlin)

MOST people do not realize how defective and complicated is the present arrangement of our calendar. It is fairly easy, for example, to remember which months have 30 days and which have 31, but to say on what week-day the 4th of May, 1871, fell, requires calculations so difficult that it is better to consult a reference book of some kind.

An international movement is now in progress for correcting this situation. The plan for dividing the year into 13 months of 4 weeks each hardly needs discussion: at first glance this proposal has a striking neatness, but it has a great defect that renders it impossible—it divides the year into 13 months, a number so awkward that it inspires hesitation in everybody. I do not like this scheme. And the opposition to it is well-nigh universal.

But I fully approve of the plan for equal quarters and half years. This proposal has just earned the approval and advocacy of the oldest learned society in the United States—the American Philosophical Society, founded by the celebrated Benjamin Franklin. According to this plan, the year is divided into 12 months, of which all have 30 days except the first month of each quarter, which has 31 days. This gives a total of 364 days, to which is added an intercalary Year-End Day and in leap years an intercalary Leap-Year

Day. The simplicity of this arrangement can be seen from the diagram of a typical quarter-year. This diagram is good for all quarters and all years, in perpetuity.

The proposal is simple and clear. It is hoped that all the nations which are members of the League of Nations; and also all those which are outside the League, will soon give it their approval. Its enactment will be a gain for all mankind.

Library Jottings

By B. S. S. GREEN

Public Librarian, Bartow, Fla.

ANY public library serves to illustrate some of the objections to our abominable Gregorian calendar. Like the schools, libraries would like to have a calendar system which would divide the months more evenly, and one that would make the incidence of holidays less haphazard.

The present calendar is a hodge-podge of months of various lengths. For instance, it happens that, in library practice, October of last year had 25 per cent more working days than the shortest month of the year. This upset accounts and statistics and working programs perceptibly. Expenses were increased, but the library budget remained the same.

Other enterprises more complicated than libraries suffer from calendar irregularities in a still more serious way.

Rotary Club Action

By LUIS MONTERO Y TIRADO

Peruvian Delegate to International Rotary Convention

(From *La Voz Rotaria*, Lima, Peru)

IMPORTANCE of the reform of the present Gregorian calendar is becoming better known each day, as is shown by the world-wide movement under the leadership of the League of Nations. Interest in this movement increases with the approach of the year 1939, when the change to the new system should take place. On January first of that year it will be possible to substitute, without any trouble or inconvenience, a perpetual calendar for the present Gregorian system. The new plan modified the old only slightly, yet in a very important manner, adapting it to the religious, legislative, statistical and commercial needs of the modern world.

In Peru a committee for promoting this reform calendar has been organized and has developed a plan of action which has insured the adherence of the Peruvian government to the plan of The World Calendar, so that our national delegates in Geneva will support this plan at the first opportunity.

As for the interest of Rotary Clubs in this matter, the central office of International Rotary in Chicago has already recommended to all its clubs the study of the question, and for this reason the clubs in Peru have placed it on their regular program and have made its importance known to the public through the press.

Business Needs It

By J. W. MUSSELMAN

Editor *Pacific L. and D. C. Journal*, San Francisco

THROUGH passing centuries civilized peoples of all nations have recorded time under the perplexing calendar devised by Julius Caesar and improved centuries later by Pope Gregory. Since then business development and changing geographical lines have brought an increasing demand for a better tabulation of weeks and months to lessen the handicaps of recording events.

Scores of reasons are advanced for a change, each practical and reasonable, which will bring lasting benefits. The new 12-month calendar is planned to equalize the days of each month, making it possible to adjust business and accounting and especially to permit an adequate comparison of statistical information. Some 27 nations have now indicated their advocacy of the improved calendar, and other nations are coming into line.

Business men, of course, will welcome a standard pay-week of 52 rather than 53 annually. The world moves on the measure of time. All calculations, salaries, interest, insurance, pensions, leases and rents are fixed on some division of the year and all are now inaccurate. With the adoption of the new calendar they will be readjusted and improved.

CURRENT PRESS COMMENT

Gathering Strength

New York Times

Two calendars are now contending for adoption. One, advocated by The World Calendar Association, has 12 months of four equal quarters, with intercalary days at the end of each regular year and the middle of each leap year. The other, the 13-month Cotsworth calendar sponsored by the late George Eastman and adopted by some business houses, seems to be losing ground because of grave objection to the insertion of a whole extra month between June and July. The two calendars would be considered again this year by the League of Nations on the request of two important members. If the sentiment that prevailed at the time of the last consideration (1931) has gathered strength, which is likely when we remember the endorsements that have since been secured from many churchmen and business organizations, the world may be asked to adopt the 12-month reform calendar in 1939. In that year January 1 falls on a Sunday. Such an opportunity will not occur again until 1950.

Desirable Simplification

Ypsilanti Press

Calendar reform is up again for consideration at the League of Nations. It is believed that calendar revision will simplify many business and legal matters. Sound reasons for it are advanced by sensible people.

Labor Acts

Manchester (Eng.) Catholic Herald

The International Labor Conference at its recent meeting at Geneva unanimously adopted a Resolution proposed by the Chilean Government delegate and supported by the Belgian delegate, urging the Council of the League of Nations to devote immediate and intensive study to the whole question of calendar reform.

The Resolution called attention to the perpetual calendar of 12 months and equal quarters recommended by the American Labor Conference in January. This system of reform (which is the same as that recently advocated by the Associated British Chambers of Commerce) embodies a fixed Easter in a fixed year in which every quarter begins on a Sunday and ends on a Saturday.

Economy and Efficiency

Indiana (Pa.) Gazette

Advocates of The World Calendar point out that besides its advantages on economy and efficiency, it facilitates statistical comparisons, coordinates the different time periods and stabilizes religious and secular holidays. Transition from the present to The World Calendar can be made without disturbance, they say, on January 1, 1939, which will fall on Sunday. After that time, if the powers agree, you may be able to know 20 years in advance that your birthday will be on a certain day of a certain week because it will never vary. The same thing will hold true of pay days and if your vacation starts on the first of July every year, you will know that it will be Sunday, the Fourth of July will always be on Wednesday, Armistice Day will be on Saturday every year and Christmas will be on Monday. There is much in favor of The World Calendar.

Objections Removed

Providence Journal

The 12-month plan, as has been emphasized again and again, removes the objectionable irregularities of the present calendar without setting up a dead level of uniformity of months and an irregularity of the year immeasurably worse than any that now exists. Such a calendar would be perpetual, and except for Leap Year would require no change from year to year. Any given date would always fall on the same day of the week. For commercial, financial and all statistical purposes, all quarter years would be exactly alike, and every month would contain exactly 26 week days.

JOURNAL OF CALENDAR REFORM

EDITORS

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ELISABETH ACHELIS, *President*

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MEETING in far-away New Zealand in October 1936, the Fourteenth Congress of the Federation of Chambers of Commerce of the British Empire passed the following significant resolution on the subject of calendar reform, carrying through to a conclusion the similar resolutions passed during the past few months by the London Chamber of Commerce and by the British Federation of Chambers of Commerce:

"This Congress, while re-affirming the resolutions adopted at previous Congresses emphasizing the great benefits which would accrue to trade and commerce from a fixed date for Easter, is convinced that the attainment of this object can best be achieved as part of a general reform of the calendar.

"The inefficiency of the present system is obvious when it is realized that the same quarters are not comparable for statistical purposes from year to year, owing to the varying number of working days in them.

"The Congress therefore urges His Majesty's governments throughout the Empire to use their influence to secure the adoption of a perpetual twelve-month calendar, divided into equal quarters of 91 days, and a fixed date for Easter."

Readers of the JOURNAL are familiar with the history of calendar reform in the councils of the various great Chambers of Commerce throughout the world. The cause of revision was first sponsored on a practical international basis by the International Chamber of Commerce, which four times in the past ten years has stated in pointed resolutions its keen desire to see the matter carried to the stage of enactment. A fifth resolution, reaffirming once more the International Chamber's continued interest, was formally submitted to the resolutions and agenda committee this month, and will presumably come before the next Congress.

The British Chambers, under the spirited leadership of Lord Desborough, have reinforced the attitude of the International body in pushing the subject on to governments with recommendations of urgency.

In the United States, the United States Chamber of Commerce has long advocated calendar reform, and countless state and local Chambers have actively aligned themselves with the movement toward a new calendar.

RECENT CALENDAR RESEARCH

British Commerce Studies

By A. DEV. LEIGH

Secretary London Chamber of Commerce

(From an official statement to the British Press)

FOR some time past, the London Chamber of Commerce has had before it the respective merits of two proposals for a perpetual calendar, one based upon 12 months and the other upon 13 months. After careful consideration the Council, on the advice of the Honorary officers and the Executive, came to the conclusion that the 13-month calendar would not be generally acceptable, but that the scheme for a 12-month perpetual calendar would confer a number of important advantages.

The proposal would insure, for example, that any given day in any given month would always fall on the same date, that the same quarter in each year would contain the same number of working days, and that there would therefore be a comparable basis for accounting and statistical purposes. The adoption of this scheme would carry with it the fixing of Easter, a reform for which the London Chamber has consistently pressed and for which provision was made in the Easter Act.

Lord Desborough, who is attending the conference which is being held under the auspices of the League of Nations on calendar reform, has undertaken to represent the Chamber's views on that occasion, and also to move a resolution on its behalf at the forthcoming annual meeting of the Association of British Chambers of Commerce. A resolution is also being submitted to the Congress of Chambers of Commerce of the British Empire.

The Council of the London Chamber of Commerce has sent to the Prime Minister, the Secretary of State for Home Affairs and to His Holiness the Pope the following resolution which was unanimously adopted by the organization April, 1936:

"That the London Chamber of Commerce, which after many years of advocacy saw the Easter Act put on the Statute Book in 1928, is convinced that the fixing of the date of Easter, which would confer great benefits upon trade and commerce generally, can best be made effective as part of a general reform of the calendar. The inefficiency of the present system is obvious when it is realized that the same quarters are not comparable for statistical purposes from year to year owing to the varying number of working days in them.

"The London Chamber of Commerce therefore urges His Majesty's government to use its influence at the Conference to be held under the auspices of the League of Nations, to secure the adoption of a perpetual 12-month calendar divided into equal quarters of 91 days, and a fixed date for Easter."

The same resolution was moved by Lord Desborough at the meeting of British Chambers of Commerce, and seconded by D. G. Ackroyd, on behalf of the Bradford Chamber of Commerce. Notice of the terms of the resolution had been circulated in advance to over 100 Chambers in Great Britain, representing 50,000 members, and it was adopted unanimously after debate by a fully representative meeting of delegates from the Chambers.

In transmitting this resolution to the British government and the League of Nations, the secretary of the British Chambers of Commerce said: "I am requested to draw your particular attention to the conclusion of the third paragraph of the resolution. The Association considered the two proposals for reform which have been put forward by the League of Nations, and after due deliberation it approved the 12-month equal-quarter scheme mentioned in the resolution."

Church Investigation

By Dr. PAUL PRESS

Chairman Calendar Reform Committee of the General Synod of the Reformed Church

(From the Official Report, Adopted and approved by the governing body of the Reformed Church)

IT has been an interesting study to follow the growth of an idea which originated even before civilization made any contribution. In its embryonic setup as far back as the primitive age some form of calendar guidance was in vogue. In following pur-

suits of life, primitive man was guided by the seasons of the year, the changes of the moon and the course of the sun. In observing the regular changes of the moon, it was easy to determine the passing of weeks and consequently we learn the designation which they gave to these changes, as for instance a certain event having transpired after so many moons. As soon as people began to form groups and to herd together, as in villages, the need of calendar guidance became apparent and a primitive science was evolved.

These so-called scientists soon learned that the passing of time had some relation to the movements of heavenly bodies, the sun, moon and stars, which led to a study which we readily recognize as astronomy. The early astronomers were priests, magicians and mathematicians, who with their limited knowledge however naturally grew into a better understanding of the forces of nature and in the course of time were enabled to discover the relationship between the moon, the stars, the sun and the seasons.

More than 6000 years ago the Egyptians were using a calendar of 360 days, 12 months of 30 days each, to which were added extra days every year to conform with the Egyptian sun. Greece and Rome also developed some form of calendar guidance. Julius Caesar has the distinction of having made the first definite contribution toward preparing a scientific calendar.

Science had made great strides in the period of the Roman era; it soon became apparent that a perfect calendar could be devised only by conforming to the supposed movements of the sun. Men learned by careful study that the actual length of the year is 365 days, 5 hours, 48 minutes and 46 1/7 seconds. The difficulty which caused much annoyance and disturbance presented itself in devising a calendar in which there could be an adequate and accurate distribution of weeks and months.

The calendar devised by Caesar, though imperfect, served civilization for sixteen centuries, until Pope Gregory XIII in 1582, guided by the advice of astronomers and mathematicians, ordered a revision of the calendar.

The Gregorian calendar has been in use up to the present time without any changes, although during this long period suggestions for possible changes had been made which received scant attention. The old Gregorian calendar seemed good enough to meet all needs.

Now, as we come to the latest revision of the calendar which engages our attention, we find the reasons for a change growing out of many demands which have come from time to time, dating far back in the past. The leaders in many branches of human endeavor—religion, science, business, education and government, base their demands for a revision upon the world changes in the late centuries, upon the improvements in communications, international relationships, as well as upon certain inaccuracies which present themselves regarding fixed dates for Church holidays, uniform arrangement of work days, length of months, etc.

The demands for calendar reform have not come from the masses of people but rather from scientists and philosophers. It is interesting to note, however, that the masses do come into real consideration and that any calendar reform must conform to the needs of the masses as pertains for instance to agriculturists, workers and the Church. It seems to be quite essential that no changes in the number of weeks, months or seasons should be considered, and that the change from the old calendar to the new should come about without much interruption. The demands for a revision have come from 50 different countries and have been directed to the League of Nations.

National Geographic Society

CALENDAR reform is the subject of a recent Bulletin issued by the National Geographic Society in Washington. After a comprehensive survey of the calendar changes in past history, the Bulletin says:

"It is not unlikely that there may be another change in our calendar. Of the more than 200 plans for calendar change studied by the commission on communications and transit of the League of Nations in Geneva, two have been singled out for special consideration. They are the 13-month year and the year of 12 months in four equal quarters."

The Bulletin continues with a detailed exposition of the two proposals.

FROM THE MAIL BAG

The purpose of The World Calendar Association is of importance as wide as the world and as deep as the life of humanity.—Rear Admiral R. P. Hobson, Pres., World Narcotic Defense Assn., N. Y. C.

I favor the 12-month equal-quarter plan as being very much more feasible of adoption. I fear that the 13 month plan will be most impossible to put over in view of powerful church opposition. — E. Clague, Dir. of Research, Pa. School for Social Work, Phila., Pa.

We are of the opinion that a new calendar must keep the division of 12 months and that the year should be divided into four identical quarters. The division into 13 months does not suit our customs. We shall do all that is possible to have Belgium favor this plan at Geneva.—A. Rey, Pres., Synod of Protestant Evangelical Churches of Belgium.

The present calendar is a source of confusion to all students. Your proposal seems most reasonable.—A. E. MacNeill, Harvard Univ.

I enjoy your JOURNAL immensely, and plead your cause whenever an opportunity presents itself.—G. L. White, Secy., Richmond Bus. College, Richmond, Va.

We wish this world-wide movement every success.—K. Bose, Gen. Secy., Natl. Council of Women in India, Calcutta.

I am very much interested in calendar reform. Every living person should be in favor of what will make life more enjoyable by simplifying the experiences and conventions of the race.—P. S. Peterson, Rolling Prairie, Ind.

I am convinced the new calendar will come but wish its coming could be expedited. A fixed Easter would mean much to the Church.—Rt. Rev. Benj. F. P. Ivins, Bishop of Milwaukee.

There is no question! The World Calendar is the one that should be adopted.—T. L. Larsen, Secy., Building and Loan Assn., Reno.

I am in favor of calendar reform as stated in the resolution of the American Association for the Advancement of Science and I am opposed to the 13-month calendar plan.—Bancroft Gherardi, Vice-Pres., Amer. Tel. & Tel. Co., New York.

I am very glad, indeed, to send in my enrollment. I find the copies of the JOURNAL intensely interesting.—Prof. C. L. Durham, Cornell Univ., Ithaca, N. Y.

I believe that all scientists would be disposed, as I am, to favor any well considered plan for simplification of the calendar.—John B. Whitehead, Dean of Engineering, Johns Hopkins Univ.

Your calendar would be a great aid to comparative statistics in business.—T. T. Ferguson, Cape Girardeau, Mo.

I have long felt that a change in our calendar is advisable.—Compton I. White, House of Representatives, Wash., D. C.

I am greatly interested in the proposal. —James R. Angell, Pres., Yale Univ.

Keep up the good work. We will have our new calendar some of these days.—O. L. Dustheimer, Prof., Berea, Ohio.

As regards the study of geophysical subjects such as meteorology, terrestrial magnetism and atmospheric electricity in which much statistical information is presented in the form of hourly values and monthly and annual means it would seem that a year of 12 equal months and 4 equal quarters would be most convenient. —J. Wadsworth, Dir., Apia Observatory, Western Samoa.

I am in favor of The World Calendar.—J. H. Northrop, Rockefeller Inst. for Medical Research, Princeton, N. J.

We believe thoroughly in calendar reform, and have no doubt that The World Calendar is the best proposition yet made. We have done what we could in our paper to forward the movement, and will be glad to continue.—C. C. Harvey, Publisher, Fort Fairfield Review, Me.

I have read with interest the literature regarding The World Calendar and I must say that it appeals to me.—Dr. E. F. DuBois, N. Y. Hosp., New York City.

I quite agree with The World Calendar of 12 months.—Prof. G. Silva, Dir., Royal Astronomical Observatory, Padova, Italy.

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S. V. Uy, Bldg. Insp., Moalboal, Cebu, P. I.
D. van Embden, Econ., Amsterdam
J. van Ginneken, Prof., Nijmegen, Holland
A. C. N. van Iseghem, Bart., Brussels
C. C. Williams, College Pres., Bethlehem, Pa.
M. E. Woolley, College Pres., S. Hadley, Mass.

INTERNATIONAL ORGANIZATIONS FOR REFORM OF THE CALENDAR

ARGENTINA: Comite Argentino del Calendario Mundial, Dr. C. D. Perrine, Chairman, Cordoba Observatory, Cordoba.

BELGIUM: Belgian National Committee on Calendar Reform, Royal Observatory, Brussels.

BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

BRAZIL: Comite Brasilero del Calendario Mundial, Captain Radler de Aquino, Chairman, Rua Raul Pompeia No. 133, Rio de Janeiro.

CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comite Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

COLOMBIA: Comite Colombiano del Calendario Mundial, Dr. Eduardo Posada, Chairman, Consulado General de Honduras, Apartado 42, Bogota.

COSTA RICA: Comite Costarricense del Calendario Mundial (Igualmente de Guatemala, Honduras, San Salvador y Nicaragua), Don Teodoro Picado, Chairman, Ministro de Educacion Publica, San Jose.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38 Parliament Street, London.

FRANCE: Bureau d'Etudes pour la Reforme du Calendrier, Paul Louis Hervier, Secy., 5 Rue Bernoulli, Paris.

GERMANY: German National Committee on Calendar Reform, Ministry of the Interior, Berlin—Der Weltbund fur Kalenderreform, Dr. Rudolph Blochmann, Secy., 24 Lorsenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform, Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRISH FREE STATE: Committee for Calendar Reform, E. K. Eason, Secy., 80 Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comite Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comite Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, Panama.

PERU: Comite Peruano del Calendario Mundial, Msgr. Pedro Pascual Farfan, Archbishop of Lima, Hon. Pres., Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia, Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatory, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., 4 Jenatschstrasse, Zurich. Comité International de Coopération de l'Association Universelle du Calendrier, M. Raymond Mage, Secrétaire Général, Rue Butini, 3, Geneva.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, Calle Sierra 2268, Montevideo.

EDITORIAL PARAGRAPHS

As it is now nearly two hundred years since the people in English-speaking countries accepted a reform in their calendar, the recent stir for calendar reform may be thought by many to be a revolutionary novelty. Neither of the two words applies to it. Calendar reform has been undertaken at intervals for some thousands of years and the present proposed change is microscopic compared to some that have been made.—Providence *Journal.*

The revised calendar would most certainly be welcomed by the men and women in industry, who find a holiday, such as Christmas, coming in the midst of a week's activities, a delusion as far as a rest period is concerned.—Lancaster (Pa.) *Intelligencer Journal.*

Much work remains to be done to enlighten public opinion if the British representative at Geneva next year is to be in a position to say that Great Britain supports reform. — Bucks (England) *Standard.*

For the calendar has a religious meaning, too, and a revised calendar will inevitably have an effect in unifying and stabilizing the church calendars of all the great communions. The significance of this movement in its bearing on church unity is what has won for it the attention and support of church leaders.—Nashville (Tenn.) *Christian Advocate.*

It is believed that calendar reform will simplify many business and legal matters. Sound reasons for it are advanced by sensible people.—Geneva (Ohio) *Free Press.*

The subject of calendars in the light of history is interesting whether or not one favors further change. — South Bend (Ind.) *News-Times.*

The matter of calendar reform is to be raised at the meeting of the League of Nations, and it will largely depend upon the attitude of the delegates there whether anything can speedily be done. The Gregorian Calendar has served us fairly well, but a more efficient system is surely on its way.—Oldham (England) *Chronicle.*

Most of the opposition to calendar reform has vanished. . . . The present Pope has expressed a friendly attitude toward further revision, and so have the leaders of other religious groups.—Greenfield (Mo.) *Vedette.*

The American Philosophical Society with a membership of 500 men of letters, science and the liberal arts, has expressed its approval of the 12-month reformed calendar.—Saranac Lake *Enterprise.*

It is expected the question will be placed on the agenda of the League of Nations this year at the request of at least two important nations. That reform is needed is undoubted.—Worcester (Mass.) *Post.*

Equalization of the quarter-years makes all quarterly and half-yearly computations, statistics and accounting accurate. Within the equalized quarters, coordination is secured among various time-units, such as the day, week and season. This complete agreement four times each year facilitates the assembling, studying, approximating, planning and comparing of reports, budgets, records and other data.—Bryan (Tex.) *Eagle.*

This year the League of Nations is likely to consider a truly new calendar. . . . Business and scientific organizations are the chief proponents of the idea.—Miami (Fla.) *News.*

There is a widespread demand for improvement of the method of reckoning the time the earth requires to spin through its orbit around the sun.—Cleveland *News.*

The reform and simplification of the calendar, we are told, are being viewed with increasing national and international importance.—Lancashire (England) *Post.*

It is rather surprising that the world has put up with the present calendar for so long. From almost every point of view it is inadequate, clumsy, and outmoded.—Charlottesville (Va.) *Progress.*

Everybody is agreed about the inconvenience of the present system, particularly in reference to Easter and its varying date.—*Western Morning News* (England).

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JOURNAL OF CALENDAR REFORM

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

FEBRUARY

S	M	T	W	T	F	S
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5	6	7	8	9	10	11
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19	20	21	22	23	24	25
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MARCH

S	M	T	W	T	F	S
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Second Quarter

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
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MAY

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JUNE

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10	11	12	13	14	15	16
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24	25	26	27	28	29	30 ****

Third Quarter

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
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AUGUST

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SEPTEMBER

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Fourth Quarter

OCTOBER

S	M	T	W	T	F	S
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15	16	17	18	19	20	21
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NOVEMBER

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DECEMBER

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17	18	19	20	21	22	23
24	25	26	27	28	29	30 *

*YEAR-END DAY, December Y, follows December 30th every year
**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a *"perpetual"* calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance."—Robert Bridges.

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APPRAISAL OF LEAGUE EFFORT

By GEORGE KENT

As Director of Public Information for the League of Nations Association in this country, Mr. Kent is eminently qualified to give this summing-up of the League's achievements in calendar reform during the past thirteen years. Through his long connection with the World Peace Foundation and other international organizations, he has been a frequent contributor to the periodical literature of League accomplishments.

IN THE YEAR 1923, calendar reform came before the League of Nations for the first time, a subject about which little was known, towards which the indifference was colossal—a subject nebulous, disorganized and completely lacking in leadership. Today, thirteen years after, we find it well established, a familiar of legislative and ecumenical councils, awaiting but the next session of the quadrennial international conference to enter the final or legislative phase.

Here is a subject on which the League has advanced steadily, consistently. Without a single backward step, it has moved inexorably forward these thirteen years through the successive stages of research, investigation, formulation of plans—surmounting each obstacle as it appeared, testing and eliminating faulty proposals, replying to criticism, satisfying legitimate regional demands.

The magnitude and significance of the League achievement can be

realized only when we understand that it has secured a general agreement on the basic principles of the problem of calendar reform, not only from the governments but also from the great world churches. In addition, it has encouraged the formation of unofficial agencies for study and for the education of public opinion in all the leading countries of the world; and finally, it has coordinated these efforts and kept them focussed on the desired goal.

The climax of League effort during the first eight years—1923 to 1931—arrived in 1931 with the sitting of a well-attended and deliberative international conference. Official delegates of forty-four nations gave their approval to progress already made and cleared the way in two carefully worded resolutions for the phase of legislation and enactment. But for an unfortunate and unavoidable circumstance this stage would have been reached by 1935.

The circumstance was the sudden death of M. Robert Haas, secretary of the League's Section on Communications and Transit, which melancholy event brought with it the decision to reorganize the Section and the quadrennial conference which lay in its domain. The conference had to be postponed, and indications today are that it will be held early in 1937.

The cause of calendar reform, however, has continued to move forward; it has been delayed perhaps by this readjustment of League machinery but the time has not been wasted. The program for the future as outlined by M. Haas will be carried forward by his successors. Drafting of an international treaty for the enactment of the proposed revision is the next step, and this will be taken during the next year, it is confidently anticipated; and after that, the signing of the treaty by the required number of nations will follow as speedily as advocates of the new calendar can stimulate action in the various world capitals.

The purpose of this article, however, is not to predict, but rather to set down an accurate record of the history of the activities of the League of Nations, as regards calendar reform, from 1923 to the present.

The subject came into the League program at the recommendation of several influential bodies—primarily, the Swiss government, the International Chamber of Commerce and the International Astronomical Union. In addition, there was pressure from England and other governments for action on the long-proposed stabilization of Easter, as an important factor in any program of calendar reform.

Prior to the World War, during the period from 1900 to 1914, there had been a widespread stirring of interest in the irregularities and inefficiencies of the Gregorian Calendar. At four important international conferences the subject had been taken up—first by the Eisenach Evangelical Conference of Churches in 1900, next by the London Congress of Chambers of Commerce in 1910; finally in 1914, by the Liege Industrial

Congress and the Paris Commercial Congress. The Swiss government, at the request of the two 1914 Congresses, had started a formal study of the subject, with a view to inviting international cooperation, when the World War broke out.

After the war, interest in calendar reform revived, and in 1919 the International Astronomical Union formed a special commission on the subject under Cardinal Mercier. In 1921 projects for a new calendar were again agitated by the International Chamber of Commerce.

Meanwhile the whole matter came before the League on the formal proposal of the Netherlands delegate in the Commission on Communications and Transit. In 1923, the League decided to set up a special committee on calendar reform under the Section on Communications and Transit.

The committee was composed of Professor Van Eysinga of Leyden, Chairman; Father Gianfranceschi, astronomer to the Vatican; Professor D. Eginitis of Athens; Professor T. E. R. Phillips, secretary of the Royal Astronomical Society; Professor M. G. Bigourdan of Paris and Willis H. Booth of New York.

The committee spent nearly two years studying the problem, seeking particularly to make clear the procedure which might best be followed, in order to obtain a joint result from the two important factors in the situation; viz., (1) the churches, (2) the governments.

Meanwhile, on November 1, 1923, Sir Eric Drummond, secretary-general of the League, addressed a letter to all governments, stressing "the great inconveniences caused in economic life and more especially in the transport trade, from the use of the present calendar," and inviting the governments to make an "advisory and preliminary" statement to the League for its guidance.

The reaction of the various governments to this request is interesting, as it forms the basis for the League's present position and for the strength of the calendar reform movement throughout the world.

ALBANIA: The proposed division of the year into 8 months being of 30 days and 4 of 31 days, is quite admissible.

AUSTRIA: Government favors fixing of Easter, but does not support general reform of the calendar.

BELGIUM: The Royal Academy agrees with the proposal for adoption of a perpetual calendar, divided into four periods of 91 days each.

BULGARIA: The scheme for the reform of the calendar, proposed by the Pan-Orthodox Commission, is being examined in Bulgaria.

CANADA: Regards with favor the idea of Easter fixation and correlation of days of week and month.

CHINA: Accepts report of International Astronomical Union, 1922.

DENMARK: Ministry of Commerce approves suggestions in principle.

ESTONIA: Easter should be fixed; 12-month year should be retained; year should consist of 52 weeks, plus one or two additional days.

FINLAND: Fixation of Easter approved; regarding perpetual calendar the Uni-

versity of Helsingfors observes that "there is not sufficient reason."

FRANCE: Office of longitudes suggests decision on perpetual calendar rests with "commerce, industry and agriculture." Director of Paris Observatory endorses perpetual calendar on basis of present Gregorian calendar, approves equal-quarter plan. Both authorities approve Easter stabilization.

GERMANY: Government recommends preservation of 12-month year in any revision of the calendar; is prepared to favor Easter stabilization.

GREAT BRITAIN: Government regards sympathetically proposals for a fixed Easter; it considers that the other proposals need the support of public opinion.

GREECE: Report inconclusive.

HUNGARY: Government accepts the proposals of the League experts as a basis for discussion, and will not refuse her adherence.

INDIA: Fixation of weekdays will fail to appeal to popular sentiment in India. Arguments for a fixed Easter have no repercussion in India.

ITALY: Replies received by the government from ministries and bureaus are in principle favorable to the proposal.

LATVIA: Government accepts unreservedly the draft proposals.

NETHERLANDS: Division of the year into 12 months should be retained; it would be advantageous to equalize the number of days in each month; no objection to Easter stabilization.

NORWAY: Director of government observatory recommends proposed equal-quarter calendar and Easter stabilization.

PORTUGAL: Government forwards opinion of Lisbon astronomers, that "efforts to improve the calendar should be of an absolutely universal character."

ROUMANIA: Orthodox Roumanian Church has no objection to proposed perpetual equal-quarter calendar.

SIAM: Government will favorably consider the proposals.

SOUTH AFRICA: The government astronomer approves a perpetual equal-quarter calendar.

SPAIN: Government forwards, without comment, favorable reports of various authorities.

SWEDEN: Government reports favorable reaction from Academy of Sciences.

While these government declarations were being received in 1924, clearing the ground for unimpeded official action by the League of Nations, a similar effort was under way with the great church bodies.

Reports were eventually received from the Vatican, the Eastern Orthodox Church, the Church of England, and various Protestant bodies, including the Federal Council of the United States. These reports varied in the degree of their advocacy of calendar reform and Easter stabilization, but they were a unit, at least, in establishing that nowhere was there any "dogmatic objection" to the League's proposals.

The League's efforts to keep the churches in step with the civil side of the movement toward a new calendar were signally successful, and a triumph in delicate diplomacy. At no point did governments seek to force the churches or to imply any jurisdiction over the ecclesiastical province. A hearty cooperation was the clearly-understood aim of every approach, and no opportunity was given for the development of those awkward jealousies regarding jurisdiction which have thwarted so many well-intentioned efforts at joint action between church and state.

From the Eastern Orthodox Church came the first overwhelmingly

enthusiastic support for calendar revision. As early as August, 1931, the official organ of the Oecumenical Patriarch in Constantinople published the official report of its delegate to the League conferences on calendar reform, approving the 12-month equal-quarter plan and the stabilization of Easter.

Eventually the other non-Roman churches reached the same decision, now embodied in the official findings of the Universal Christian Council, and in the warm approval of calendar reform voiced on behalf of the Church of England by the Archbishop of Canterbury in an official utterance before the House of Lords last April.

The attitude of the Vatican has at all times been one to encourage League leaders in their efforts toward a new calendar. "The subject of calendar reform is under constant consideration at the Vatican," says the significant report of the Cabrol Mission, sent to Rome in 1935. "The subject is viewed by the Vatican as a whole, and the question of Easter stabilization cannot be detached from the question of general reform. Before any action by the Holy See can be contemplated, unity should be established between advocates of differing methods of reform. Such agreement should have formal approval from leading governments. If such agreement is reached, and the nations present the Holy See with a request to examine the question, the request would be welcomed. The Vatican is in favor of a 12-month system and is averse to a 13-month year."

Progress made by the League of Nations since the international conference in 1931 has been largely conditioned by the necessity for gathering up all the odds and ends of official opinion and action, and for permitting the crystallization of public acceptance in many countries through the activities of non-official and semi-official promotional committees and organizations.

In 1935, the League official in charge of calendar reform, M. Robert Haas, visited America and conferred with representatives of The World Calendar Association regarding the quadrennial meeting of the Commission of Communications and Transit, which planned to take up an energetic re-consideration of calendar matters in the Spring of 1936. M. Haas' sudden death a few months later necessitated a postponement of the program which he had laid out, and the gap left by his departure will probably necessitate a realignment of the League program looking toward the enactment of the new calendar.

Students of international comity will continue to follow with the keenest interest the development of the calendar reform movement under League guidance, because it represents a fresh and encouraging instance of the ability of the nations to work together toward a common and advantageous end. It has a profound significance in the efforts of governments to act together; it will establish precedents which will eventually indicate the path toward world peace and unity.

ORIGINS OF CHRISTMAS

By THE ABBÉ CHAUVE-BERTRAND

A few months ago there appeared in Paris a 256-page book on the subject of calendar reform, under the title "La Question de Paques et du Calendrier." The author, Abbé Chauve-Bertrand of Nevers, has been a student of the subject for more than a quarter century. He was the secretary of the Commission on Calendar Reform of the International Astronomical Union, whose report became the basis on which the League of Nations first took up the subject of calendar revision. The Abbé, long a lavish contributor to the scholarly literature of his church, has written for this issue of the Journal a charming and delightful study of the origins of Christmas.

THE FEAST of the Nativity of the Savior has not existed from the beginning of the Christian era. It was only in the fourth century, or the end of the third, that it appeared at Rome. When it took root there, nobody was in a position to prove that the event had taken place on the 25th of December. Mgr. Duchesne, in *Les Origines du Culte Chrétien* declares that "there is no tradition concerning the date of the birth of Christ." Surprising as the fact may be, it is indisputable, whatever one may say about it. Why, then, has the Roman Church placed the anniversary on this day?

Duchesne thinks that the date of the birth of Christ was arrived at by reckoning from the date believed to have been that of His death. Many Churches in the first centuries, discouraged by the difficulties of calculating the date of Easter in the complicated and uncertain processes of those days, chose the symbolic date of March 25th to commemorate Christ's death, and that of March 27th for His Resurrection. With the former date as a point of departure, and on the supposition that Christ passed an even number of years on earth (since fractions were an imperfection to be eliminated)—Christ's conception was also set down at the spring equinox. And thus, after the nine months of pregnancy, Christ's birth would have taken place on the 25th of December.

Such is the reasoning developed by Mgr. Duchesne, who adds, nevertheless, that the argument would be more valuable if it could be substantiated in some ancient document. Unfortunately it cannot.

The Abbé Vacandard, in his *Etudes de Critique et D'Histoire Religieuse,* would not admit this explanation whereby the 25th of March would have governed the 25th of December; and it is, indeed, hardly reasonable, considering that the feast of March 25th (Incarnation or Conception) is much later in origin than that of December 25th. "With reason," says Dom Leclerg, the learned collaborator of Dom Cabrol, in the *Dictionnaire D'Archeologie Chrétienne, CXXXI, 908,* "Vacandard maintains that the

25th of December governed the 25th of March." Once more, then, why has the Church chosen the 25th of December?

In all probability, this date was chosen because it was the day of the winter solstice (the 25th exactly, according to the Roman calendar of that time)—a day when the pagan cults at Rome, in Egypt, in Persia and elsewhere celebrated the rebirth of the sun—the feast of the *Natalis Invicti.* The *Invictus* was Mithra, who personified the sun. It is believed that in the third and fourth centuries, when this cult of Mithra had spread very widely, the Church sought to oppose Christ, the spiritual Sun, to the pagan sun god. One finds in the Apologists and the Fathers of that epoch expressions which show such a thought. The Prophets had designated the Messiah as the "Sun of Justice": *Orietur Vobis Sol Justitiae.* When Simon received the Savior in the Temple, he greeted Him as the Light which was to enlighten the nations: *Lumen ad Revelationem Gentium.* Saint Cyprian calls Christ "The True Sun," and Saint Ambrose cries: "This is our *New Sun,*" etc. This metaphorical language was quite frequent in those days. However, the eloquence of the preachers was not enough. Much more effective was the practise of counteracting the pagan ceremony with a Christian solemnity in which was celebrated the birth of the One who was presented as the true Sun. All this is very well explained by Dom Botte, in *Les Origines de la Noël et de L'Epiphanie.*

There is more. The scholarly study of Dom Botte brings to mind that our Christmas crib surrounded by lights and approached with reverence on Christmas Eve, is not without resemblance to a pagan ceremony. According to the testimony of Macrobius and of Saint Epiphanius, the Arabs of Petra, the inhabitants of the Valley of Elousa in Idumea, and certain others in Egypt, had the custom of taking from a sanctuary, at the time of the winter solstice, an idol of the sun, represented as a new born child, whilst the priests went along in a sort of nocturnal procession and chanted the following: "Korah, the Virgin, has given birth to Aion." *Aion* was the new sun. As to the Virgin "There is no doubt," says Dom Leclerg in the *Nativite de Jesus,* "that the *Parthenos* who was the mother of Helios by this astral mythology, is the *Virgo Celestis,* the fertile virgin."

To get to the bottom of this explanation, it remains to be said who this celestial virgin was. She was simply the one whose name figures in the signs of the Zodiac. We know that the sun, in its apparent annual movement, describes on the celestial sphere, a line called an ecliptic—so named because the eclipses are produced on this line. Now, to indicate the place in this region of the sky where the sun was at a given moment of the year, the first astronomers, Egyptian and Chaldean, divided the ecliptic into 12 equal parts and gave the stars which were in each of these parts, names which were chiefly those of animals, from whence the word Zodiac, from *Dzõdia,* animals. These names originated from the most strik-

ing phenomena of nature and of the earth present at the time that the sun was in each of these 12 parts. Thus they called that part of the stars in which the sun was found at the time when the lambs were born, *Aries,* or sign of the Ram, or stars of the Ram; stars of the Bull or of *Taurus,* were those under which it was time to put these animals to the plow to till the earth; stars of *Aquarius,* those of the period of rain and the floods of the Nile; stars of *Cancer,* or of the Crab, those under which the sun, having arrived at the middle of its course, began to go back like the crab who walks backwards; stars of *Virgo,* or the Harvest Virgin, those under which young girls were seen in the fields cutting the grain or reaping. And thus, on charts of the Zodiac, the ancient astrologers represent the Harvest Virgin, sometimes as governing the family, and sometimes as holding grain in one hand and a branch laden with fruit in the other. Now, after the harvest season, the stars of the Virgo Constellation descended slowly. When they disappeared on the horizon, the sun, at the winter solstice, was placed as though in the bosom and was born, so to say, in the arms of the celestial virgin at the heliacal rising on the eastern horizon; it was he who, in this guise, was represented as a child nursed by a chaste virgin, in the astrological pictures of the wise men of Persia.

Let no one be frightened by all this. It is a delight to be able to go back, when possible, to the origins—to follow historical developments and distinguish their outlines: To proceed from the astronomical sun to the spiritual Sun, from the Zodiacal virgin to the Crèche of the infant, from the ancient New Year's gifts to our Christmas Trees. We do not realize fully how much the liturgies owe to astronomy. Pius XI, inaugurating this year the observatory at Castelgandolfo, made an allusion to this in speaking of the "connection which exists between religion and the science of the stars." The date of the winter solstice is naturally indicated to be the time of a great feast. The ancient cults anticipated it. Instead of throwing out the sparks of truth that they possessed, it seems better to gather in everything, and, following the example of the Church in the first centuries to emulate the bee, which collects from all the flowers and distills from them a glowing ambrosia. Concerning the feast of Christmas, the pagan influence cannot be denied; only, the sun, object of the pagan cult, is now but a symbol of Christ for the Christians. One is the pedestal of the other. The lovely feast of Christmas is therefore the day of the rebirth of the sun at the winter solstice and, at the same time, the day when the Church celebrates the birth of Jesus, Sun of Justice, Word made man, with whose birth it is fitting to associate the birth of all men, and thus to have the feast of the Infant-God and the feast of all human infants at the same time. For without the births of the latter, humanity would perish, as the world would perish without the rebirth of the sun at the end of each year.

COMES THE NEW YEAR

By Mary Porter Russell

(*From the Cleveland News*)

EVERY New Year's Day, the houses of the land are filled with new calendars. By the millions they come into use, bright and new, large and small. We study them quizzically for a moment before we place them on our desk or hang them at our bedside or above the kitchen sink.

We study them for a moment, and run our hands over the unborn days. For the calendar refuses to be regarded as merely a tabulation; it is time made tangible, it is a portion of our lifetime, measured, definite, awakening hope and awakening fear, arousing us from our lethargy.

The calendar has become so essential to us it is difficult to realize that man lived long years upon the earth with no means of making note of the seasons or of counting the passing days. The length of the year was too big a thing for the mind of primitive man to comprehend. He was amazed and bewildered by the myriad of ever-shifting stars, by the apparently varying speeds of the sun-god in traveling from east to west. He was baffled, too, by the mysterious phases of the moon; and the coming of the harsh seasons was a fearful thing, brought by wrath of gods or chance.

But eventually man began his crude attempts to measure time. The evolution of our calendar from those early beginnings to the present day is filled with inconsistencies, and haloed with romance.

The variation of the length of years has been extremely wide. The first "year" consisted of the period of time in which each moon waxed and waned, for the moon was more easily studied than the sun or stars.

Years of one moon or month grew tedious in time, and five moons (the number that could be counted on one hand) became the established year. Later the year was increased in length from five moons to six, from six to 10, and finally to 12. These moon months consisted usually of 30 days, and the days were counted off by the use of bundles of sticks. Each morning one stick was drawn from the bundle until the days that were to be became days that had vanished into the past. It was not until the Egyptians learned something of the relationship of the earth and the sun, and began measuring the shadows of their huge pyramids, that the true length of the year was discovered as being 365.242 days. Even after this discovery the Egyptians retained their 12 months of 30 days each, and used the extra days as festival days to be celebrated at the end of the year.

It is easy to trace the increasing lengths of the years through the diminishing ages of Biblical characters. Methuselah, that grand old man who is said to have lived 969 years, was, in reality, only 79 years old when

he died, for he lived in the era of single moon counts. Adam, if we subject him to the indignity of measuring his life by full-length years, spent 75 years upon earth instead of 930. Noah 77, instead of 950. Abraham and Isaac belonged to the era of five-month years, and so lived not 175 and 180 years, but 72 and 74. Jacob, coming in the six-month period, lived only 73 of the 147 years with which he is accredited.

During their sojourn in Egypt the Israelites learned the true length of the year, but while there they held tenaciously to their forefathers' six-month year. After the exodus from Egypt, however, the ages of men recorded in the Bible are within the normal range of lives.

The Egyptians and the Israelites kept their precious information to themselves, and the scattered nations and tribes of Europe used notched sticks to tally five, six and 10-moon years until Numa, the Roman king during the seventh century before Christ, added the months of January and February to make 12, alternating 29 and 30 days to each moon. Even with the addition of these two months, however, the year consisted of only 354 days, and the calendar had come into hopeless confusion by the time of Julius Caesar.

Many persons are of the opinion that Caesar originated the calendar which came to bear his name, and which, in modified form, is now in almost universal use. The fact is, however, that he adopted it from the Egyptians after conquering Egypt in 46 B. C. It seemed obvious that the ever-wandering moon calendar could never be made satisfactory, and Caesar was delighted with the advantages the sun calendar offered. Only one difficulty worried him: the Egyptians used 12 equal months of 30 days each. Twelve months of even numbers of days could not be tolerated, he insisted. Was it not odd numbers that were lucky?

The outcome was that the Egyptian calendar was adopted with one important change; namely, the five extra days (six in leap year), which the Egyptians had celebrated as festival days, were distributed throughout the year, and since it was desired that every alternate month be made 31 days long, one day was subtracted from February, leaving that month with only 29 days. The months were divided into Kalends, Nones and Ides. The Kalends were the first of every month, the Nones and Ides were the seventh and fifteenth of March, May, July and October. In other months the Nones were the fifth, Ides the thirteenth. Dates were reckoned backward.

The days of the months were juggled about still further after Julius Caesar was assassinated in 44 B. C. His successor, Augustus Caesar, consumed by a desire to equal in importance his distinguished uncle, demanded that there be as many days in the month of his birth (August) as in the birth month of Julius (July). The twenty-ninth day of February therefore was taken away and added to August. To avoid having three successive months of 31 days each, the thirty-first days of September and

November were given to October and December. "Thirty days hath September," said Augustus, and 30 days it continues to have.

Another idiosyncrasy of the Julian calendar which has come down to us through the centuries is the date of the beginning of the year. Caesar planned to begin his year with the winter solstice, Dec. 22. At this time the sun has reached its farthest position south of the equator, and begins to return, with promise of new warmth, to northern latitudes. Since prehistoric times, men have made this event an occasion for celebration and rejoicing. From the standpoint of both logic and sentiment, it would seem the proper day to herald the new year. But the people of Rome were grounded in the belief that the new year must begin with a new moon, and Caesar thought it expedient to accede. Jan. 1, therefore, was placed on the first day on which the new moon appeared after the winter solstice.

Only two important changes have been made in the Julian calendar since its adoption in 46 B. C. The first was the recognition of the seven-day week as an official division of time. This was brought about by Emperor Constantine's edict of 325 A. D., which sanctioned the Christian Sunday as a day of rest, and authorized the use of seven pagan names—the ones still in use—to designate the seven days of the Christian week.

The second change occurred more than twelve hundred years later, when it was decided that a defect in the leap year rule must be remedied. Caesar had based his calendar on a 365.25-day year, and had ordained that there be an extra day added to February every fourth year to rectify the irregularity. But in reality there are only 365.242 days in the year, and the observance of leap year every four years caused the calendar gradually to fall behind the sun. The discrepancy was too slight to be noticed at first, but by 1582 A. D. the calendar year was 10 days out of place. Pope Gregory XIII, upon the advice of prominent astronomers, dropped these 10 days from the calendar and established a new leap-year rule that three century leap years in each 400 years must be non-leap years.

The Gregorian calendar was adopted by all Catholic countries in 1582. Protestant Germany did not accept it until 1700; and Great Britain, with all her colonies, including the United States, refused to acknowledge it until 1752. Since a leap year was skipped, under the Gregorian calendar, in 1700, it was necessary for Great Britain to drop eleven days instead of the ten days cancelled by Pope Gregory. These eleven days were dropped between Sept. 2 and Sept. 14. It is because of this calendar change that George Washington's birthday is celebrated on Feb. 22. According to the Washington family Bible, he was born on "Ye 11th day of February."

For many years after the reform of 1752, dates were referred to as "old style" and "new style," and one can surmise that considerable confusion existed. But finally the confusion passed away, and people ceased to remember that there had ever been other than "new style" dates.

A movement has been under way since the early days of the present century to make further and more drastic changes in our calendar so that its faults may be minimized. Out of the several hundred plans formulated to this end, two have received prolonged consideration. One of these calls for a division of our days into a 13-month year; the other provides for a rectifying of the present 12-month calendar, with four equal seasons.

Absolute simplicity is, of course, unattainable because day and year, week and year, lunar month and year, are incommensurable periods of time. Proponents of reform, however, are strong in their conviction that we should correct our calendar's most obvious faults and should seek to bring it as near as possible to perfection and simplicity.

Both the 13-month and equal-quarters plans of revision call for the fixity of our calendar by the intercalation of a year day every year and a leap day every four years, year day to be added at the end of December and leap day at the end of June. These days would belong to no week and, therefore, would not interfere with the permanent relation of weekdays to specific dates. The assortment of days in any month would be exactly the same as in the same month of the preceding year. Calendars would be made of durable materials, and there would be no hanging of fresh, new ones each year as in the quaint and inefficient past.

Both the 13-month and equal-quarters calendars would change many of our holidays to the Mondays preceding their present dates, so that extended week-ends might be enjoyed; and Easter Sunday, which now wanders from March 22 to April 25, would be fixed at some certain date, probably early in April.

There are religious sects which object sincerely and conscientiously to any calendar change. Against these stand many who would welcome the change personally on the ground of efficiency and, with them, a group of crusaders who see in the reform a genuine boon to all mankind, and who believe that we should tolerate willingly the inconveniences of its introduction for the sake of the generations to come.

RESOLUTIONS FOR THE WORLD CALENDAR

DURING the past two months, resolutions in favor of calendar reform have been passed by three organizations whose approval carries considerable weight in their respective fields of activity. The Ninth Scientific Congress of Chile approved and endorsed The World Calendar "because of its simplicity and obvious advantages." The South Carolina Academy of Science urged endorsement of The World Calendar by the United States Government. The Institute of Radio Engineers petitioned the U. S. Government to support The World Calendar in international activity toward calendar revision. Other resolutions in favor of The World Calendar were passed by the National Association of Education of Chile, and by the American Lutheran Church.

THE CALENDAR AND THE SEASONS

By H. W. BEARCE

U. S. Bureau of Standards

Publication Approved by the Director of the National Bureau of Standards of the U. S. Department of Commerce

IT HAS been suggested that if and when a revised calendar is adopted it would be well, in addition to making the calendar perpetual, to change the time of beginning of the year so that it would coincide with the winter solstice, which occurs on or near December 22nd under our present calendar.

It is assumed by those who advocate a change in the time of beginning of the year, that by such a change the four quarters of the calendar year could be made to coincide with the four seasons. Under such a plan, January, February and March would be designated as winter; April, May and June, as spring; July, August and September, as summer; and October, November and December, as autumn.

At first thought this plan might appear to be feasible and a desirable addition to the simplification of the calendar. Further study, however, reveals the fact that it is not feasible.

It must be remembered that the seasons are regulated by the relative positions of the earth and the sun, and that while we can adjust and regulate the lengths of the months and the quarters, we cannot regulate the lengths of the seasons; since the seasons are of unequal length. The only way we can make the quarters and the seasons coincide, is to make the quarters of unequal length—the very thing, or one of several things, that calendar revision is designed to avoid.

If, then, we cannot make the seasons and the quarters agree, without having quarters of unequal length, and if the only purpose to be served by moving the beginning of the calendar year to the winter solstice, is to make the seasons and the quarters agree, we might well conclude that it would be best to leave the beginning of the year where it is at present; that is, some 10 or 11 days after the winter solstice.

In support of the above conclusion there are given below a few simple astronomical facts which have an important bearing on the case. These facts are derived from the dates of the solstices and equinoxes over a series of years, as furnished by the U. S. Naval Observatory.*

	Spring	*Summer*	*Autumn*	*Winter*
1940				Dec. 21....23.9
1941	Mar. 21.... 0.4	June 21....19.6	Sept. 23 ...10.6	" 22.... 5.8
1942	" 21.... 6.2	" 22.... 1.3	" 23....16.3	" 22....11.7
1943	" 21....12.1	" 22.... 7.2	" 23....22.2	" 22....17.5
1944	" 20....17.8	" 21....13.0	" 23.... 4.0	" 21....23.3
1945	" 20....23.6	" 21....18.9	" 23.... 9.8	

(Greenwich Civil Time)

*cf. "Kalendar und Chronolog. Tafeln," Dr. Robert Schram, Vienna (1908, Liepzig).

From the above table of dates (day and hour), on which the sun reaches the solstices and equinoxes, it is found that the seasons have the following lengths: Winter, 89 days, 0.4 hour; spring, 92 days, 19.1 hours; summer, 93 days, 15.0 hours; autumn, 89 days, 19.3 hours. These figures are not exact, but are believed to be correct to the decimal place given; that is, to 0.1 hour, or 6 minutes.

Because of the shape of the earth's orbit, and the variable speed of the earth in its yearly journey around the sun, the seasons are of unequal length. That is, the time difference between successive arrivals of the sun at winter solstice, vernal equinox, summer solstice, autumnal equinox, and again at winter solstice, is not constant, but varies from 89 days, 0.4 hour between winter solstice and vernal equinox, to 93 days, 15.0 hours between summer solstice and autumnal equinox. The seasons, therefore, as governed by the apparent position of the sun, do not lend themselves well to use as subdivisions of the calendar year.

It is seen from the table how the year's excess over 365 days, i.e., 5.8 hours approximately, accumulates through 1941, 1942 and 1943, and then, in 1944, how the accumulated error is corrected in leap year.

If a new calendar so revised as to make January 1 coincide with the date of the winter solstice and at the same time fall on Sunday, were to be put into effect, it would, of course, be necessary, in order to avoid interruption of the regular succession of the days of the week, to select a year in which the winter solstice falls on Sunday. It would be desirable also to select a year in which the sun reaches winter solstice at or near midnight on the morning of the first day of the new calendar, in order that the seasons and the calendar might start out "in step."

The desired combination of dates and days of the week will occur in December, 1940, when the sun reaches winter solstice at 11:54 Saturday, December 21. Thus, if, the new calendar were to be put into effect at midnight on the morning of Sunday, December 22, 1940, this date being changed to January 1st, 1941, the beginning of the calendar year and the beginning of the winter season would be in coincidence within about six minutes. They would not, however, remain so closely in coincidence for long, because of the fact that the tropical year does not contain an integral number of days and in addition, are of unequal length.

From the astronomical facts as above set forth it is evident that equal quarters cannot be made to coincide with seasons of unequal length. In view of this fact it is further evident that there is little, if anything, to be gained by making the beginning of the calendar year coincide with the winter solstice. Therefore, it would seem wise to leave January 1st where it is, and to devote our efforts to the perfection and adoption of a perpetual calendar, having equal quarters, such as that advocated by The World Calendar Association.

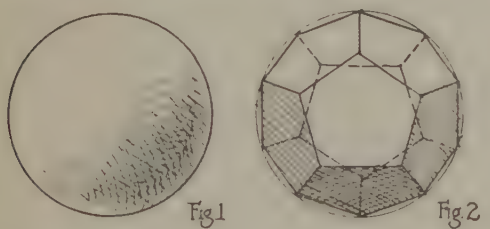
"STAR OF PERFECTION"

By CLAUDE BRAGDON

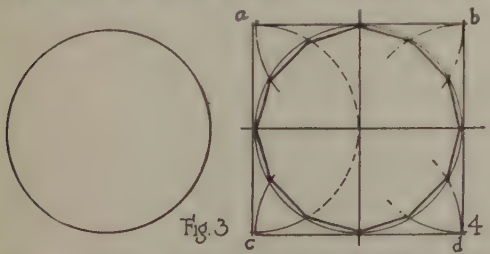
The author derived the phrase, "The Star of Perfection," together with certain of the ideas contained in this article from "The Kaballa, or Mystic Figure of the Egyptians," a remarkable work by George Henry Felt, written in the early part of the Nineteenth Century, unearthed by Viola Louise de Gruchey and placed in the hands of the present author.

REASONS for the adoption of The World Calendar are so numerous and convincing compared with those advanced in favor of any other—particularly the 13-month calendar—that little more can or need be said about it. There is one aspect of the matter, however, which has not been given sufficient importance from the standpoint of the philosopher, the artist, and the geometrician, to all of whom The World Calendar should particularly commend itself. This view I shall attempt here briefly to present. It has to do with the significance, symbolism, and peculiar properties of the number twelve.

If we are dealing with problems in solid geometry, the circle would represent a sphere or ball *(Fig. 1)*, and its geometrical plane equivalent would be represented by the regular dodecahedron, bounded by twelve pentagons *(Fig. 2)*. The corresponding pentagons on the back of the dodecahedron are represented by dotted lines. This the Deity, according to Plato, employed in tracing the plan of the Universe. It was regarded as the equivalent of the sphere, both being thought of as absolutely perfect figures.



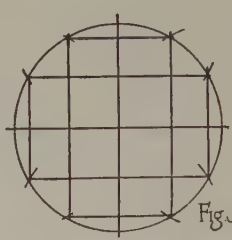
I. THE SPHERE & THE DODECAHEDRON

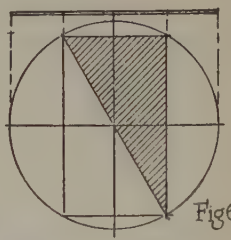


II THE CIRCLE AND THE DODECAGON

As we are confining ourselves to plane geometry (for the particular purpose in view) we must trace the corresponding perfect figure in that branch of the science. This is, of course, the dodecagon, or figure of twelve equal sides, which can be geometrically inscribed in a circle—the plane correlative of a sphere *(Fig. 3)*—by drawing first the vertical and horizontal diameters and from the four points of intersection of these diameters with the circumference, with a radius equal to the radius of the

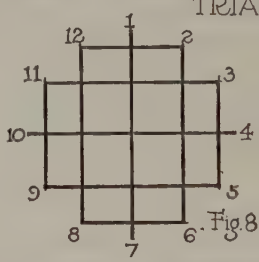
circle, laying off the points of the dodecagon on the circumference *(Fig. 4)*. The intersections of these arcs outside the circle yield the vertices *(a, b, c, d)* of the circumscribed square.

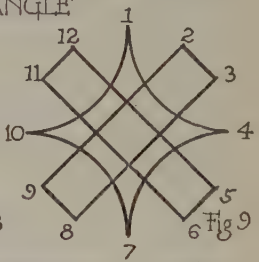




THE TWO RECTANGLES & EGYPTIAN TRIANGLE

To show the geometrically proportional properties of this figure, we connect all the points of the dodecagon, two and two, by horizontal lines, parallel to the vertical and horizontal diameters *(Fig. 5)* and we have the perfect figure in plane geometry which, with the circle, was analogous to the dodecahedron and the sphere in solid geometry, according to the traditions of the Egyptian and Greek mathematicians.





POLYGONAL SYNOPSIS-WORLD CALENDAR

This figure formed by the combination of the upright and horizontal rectangles has been called *"The Star of Perfection,"* and with good reason, for these rectangles will each be seen to consist of two Egyptian triangles (right angled triangles, one side of which is equal to one half the hypothenuse), placed hypothenuse to hypothenuse *(Fig. 6)*. The rectangles also divide the diameters into four equal parts. Furthermore, they are root-three rectangles. Root rectangles are figures of Dynamic Symmetry possessing remarkable mathematical properties, so-called because their sides, not commensurable by linear units, are commensurable by the areas of their respective squares. The square on the short side of a root-three rectangle is one-third of the area of the square on the long side *(Fig. 7)*. Hence the name, a root-three rectangle, because the short side is to the long side as one is to the square root of three $(1 : \sqrt{3})$.

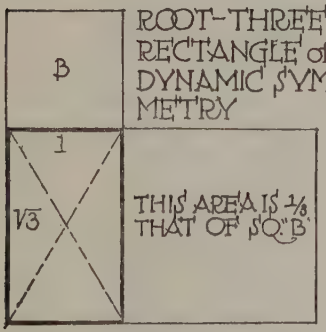
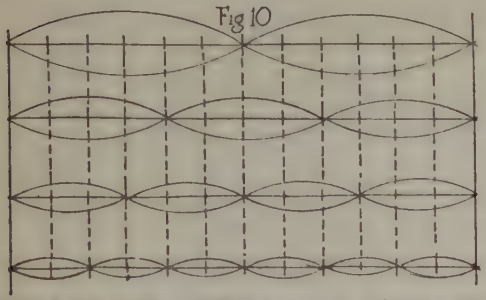


Fig.7

Now when we apply this "Star of Perfection" to The World Calendar of twelve months, arranged in the usual circular form, it is seen that the thirty-day months (eight in number) coincide with the eight apexes of the two rectangles, and the thirty-one-day months (four in number) coincide with the four extremities of the vertical and horizontal axes *(Fig. 8)*.

In order to further differentiate the thirty-day months from the thirty-one-day months, let us connect the former with straight lines drawn diagonally across the circle, and the latter with the arcs of circles *(Fig. 9)*. This results in a figure of considerable intrinsic beauty, for it is one of those androgynous symbols, like the *crux ansata* of the Egyptians, and the "rose and the cross" of the Rosicrucians, made up of a straight and angular member (masculine) and a curved member (feminine)—the *Yang* and *Yin* of Chinese philosophy, *Yo* and *In* to the Japanese.



THE NON-FRACTIONAL DIVISION OF 12 INTO HALVES, THIRDS, QUARTERS

Such a geometrical synopsis of The World Calendar is not something forced, but a natural and obvious thing. It serves to make plain to the eye that inherent harmony and perfection which it has to the mind. In order to realize that such is the case, try to apply a geometrical synopsis to the 13-month calendar. If beauty and symmetry be the desiderata it clearly defies every attempt in that direction. The reason why the first lends itself to such treatment and not the other is because of the harmony inherent in the number twelve, which is the first important *conjunctive* number. Let me try to explain just what I mean by that.

The progression and retrogression of numbers in groups as expressed by the multiplication table give rise to what may be termed "numerical conjunctions." These are analogous to astronomical conjunctions: The planets, revolving around the sun at various rates of speed and in different orbits come at certain times in line with one another and with the other heavenly bodies. Then they are said to be in conjunction. Similarly, numbers, advancing toward infinity singly and in groups (expressed by the multiplication table) at certain stages of their progression come into relation to one another—notably in the number twelve, for of a series of twos it is the sixth; of threes, the fourth; of fours, the third; and of sixes, the second *(Fig. 10)*. It stands to eight in the ratio of three to two; and to nine, of four to three. It is related to seven, the sum of three and four, by being the product of these two numbers.

It would seem obvious that the number of months in the year should be capable of division into quarters on account of the four seasons, which are determined by the earth's relation to the sun, and are more important than the moon's relation to the sun and earth, which is the only astronomical justification for the 13-month year. The other reason advanced by its advocates is that it makes the months exactly divisible into weeks. This seems too trivial to deserve consideration, because so clearly inspired by the desire of Big Business to simplify its accounting, for then the weekly pay-off would be commensurate with the monthly pay-off. All this is entirely beside the mark; it is a rendering to Caesar the things which are God's, and could result only in confusion and disaster.

BRITAIN'S KEY POSITION

By J. B. PERRY-ROBINSON

Secretary, Rational Calendar Association, London

IN THE world-wide movement for calendar reform, Great Britain occupies in one sense a key position. At the League of Nations, where the United States is not a member, it has often fallen to the lot of Great Britain to take the lead, particularly in non-political matters of international administration. It is a saying at Geneva that "if you have the French with you and the British not against you, you can get what you want."

It was typical of many League conferences that at the 1931 Calendar Reform Conference, Sir John Baldwin's attitude particularly in his refusal to accept the report of the Preparatory Committee as the basis for discussion, should have influenced the whole course of the Conference. His instructions from the British Government were to support a declaration in favor of a fixed Easter, but he had virtually no instructions in regard to general calendar reform, and consequently the British attitude on the major question was entirely negative, which was probably the major factor in determining the negative character of the Conference's action on the general question on that occasion.

In order to avoid a recurrence of such a position when the League next takes hold on calendar reform, the Rational Calendar Association has for the past twelve months been directing most of its energies to providing the British Government with evidence of a strong British movement for general reform.

In Great Britain, representative opinion is paramount. It is difficult to get the British public to express an *ad hoc* opinion on any subject, and it will certainly only do so through the medium of its accredited mouthpieces. Consequently, it has been the policy of the Rational Calendar Association to approach the organizations representing industrial, commercial or religious opinion and persuade them to make pronouncements about calendar reform in the ordinary course of their representations.

By the declaration of support for 12-months reform promulgated by the Federation of the Chambers of Commerce of the British Empire (already reported in the Journal) a long chapter in this work has been brought to a close. During 1933 and '34 some two dozen of the Chambers representing major towns in the British Isles passed resolutions advocating a Fixed Easter and a measure of general reform. In 1935 this body of opinion crystallized in a resolution before the Association of British Chambers of Commerce in support of a fixed Easter. Early in 1936 the

movement was carried a step further by the passage of a resolution by the London Chamber of Commerce (which has always taken the lead among the commercial community of this country on calendar reform matters) stating that the best means of obtaining a fixed Easter was now its inclusion as part of a general scheme of 12-months reform. This resolution was taken up at the annual meeting of the Association of the British Chambers and was adopted as an expression of the views of the whole commercial community of the United Kingdom. The final stage was the proposal of a similar resolution at the October meeting of the Federation in New Zealand at which all the Chambers of Commerce of the British Empire were represented. It was again adopted unanimously and a complete and comprehensive expression of British commercial opinion has thus been achieved.

In the past four years a number of resolutions have also been forwarded to the Government by representatives of industrial opinion. Each industry in Great Britain has its own trade association which forwards to the Government representations on behalf of all the interests concerned in the trade. The latest of such resolutions are those adopted this summer by the National Federation of Grocers' Associations and by the Drapers' Chamber of Trade on behalf of all the grocery and drapery interests of the country. Both these resolutions advocated the equal-quarter plan of calendar reform for its own sake and also as the best means of obtaining a fixed Easter.

Apart from industrial and commercial opinion, the Government has also been informed of the views of several of the major "professional" communities. Chief among these where calendar reform is concerned are the statisticians, and in this field the Royal Statistical Society of Great Britain occupies a dominant position. At the instance of the Rational Calendar Association the Society last year appointed a committee of distinguished representatives of all the branches of statistics to consider the merits, from the statistical point of view, of calendar reform in general and to scrutinize all the different methods of reform that have been proposed. This Committee reported that a reformed calendar would be of benefit to statisticians, categorically denounced the 13-month scheme and embodied in its conclusions a reference to The World Calendar.

In preparing any estimate of national opinion the British Government will naturally consult astronomical circles whose concern with reform is almost as close as that of the statisticians. There is no representative body accustomed to expressing British astronomical opinion, but the Secretary of the Rational Calendar Association recently had an interview with Dr. Spencer Jones, the Astronomer Royal, who stated that he personally was in favor of a reformed calendar on a basis of 12-months and equal quarters. Dr. Jones gave it as his opinion that astronomers in general would

not accept a 13-month year. Other groups, such as the bankers, accountants and the underwriters of Lloyds have also stated their views to the Government at one time or another, mainly on the Easter question, which has now come to be identified with general calendar reform.

As regards the all-important question of the attitude of the Church, an emphatic pronouncement was made this year by the Archbishop of Canterbury himself in the House of Lords. Dr. Lang was speaking in the course of a debate on calendar reform arising out of a motion by Lord Merthyr urging the immediate introduction of a fixed calendar. After Lord Merthyr had introduced his motion, Lord Desborough recommended to their Lordships the particular scheme of reform known as The World Calendar, and then the Archbishop rose and in carefully measured terms, obviously determined by the consciousness that he was speaking on behalf of the whole Church of England, said that "he had found it impossible to resist the plea for this reform." This statement which was the first public pronouncement of the attitude of the Church of England on the general question as distinct from the Fixed Easter question, is certain to carry great weight with the Government, when the time comes to determine the attitude to be adopted by its representative at Geneva.

Lord Desborough, as the father of the calendar reform movement in Great Britain, naturally played a leading part in this debate in the House of Lords. Readers of the Journal will be well aware of the great influence which he has exerted in the cause of reform for many years. It is natural that his name should stand at the head of the list of the Vice-Presidents of the International Committee of Co-operation recently formed to take the lead at Geneva in all calendar questions. His energy and enthusiasm are of the greatest service to the movement, and the Rational Calendar Association is fortunate in having the benefit of his advice and his co-operation.

Among other distinguished individuals in Great Britain who have expressed approval of calendar reform on the lines advocated by the Rational Calendar Association are Lord Gainford, Mr. H. G. Wells, the Dean of St. Pauls, the Dean of Canterbury, Sir Francis Goodenough and Sir Stanley Machin.

The growth of British public interest in calendar reform during the five years that have passed since the last League of Nations Conference is unquestionable. References to it appear frequently in the national press, and they no longer have that derisive tone which was customary when calendar reform was regarded as involving a 13-month year. British opinion is perhaps still too conservative to take the lead in an international reform of this kind, but it is probably not too much to say that without British acquiescence, no such reform could ever be introduced.

That acquiescence will be forthcoming next year. The general aim of the activities of the Rational Calendar Association during the past year has been to impress upon the British Government that there is a strong body of responsible opinion in this country that recognizes the need for reform and advocates the equal-quarter plan. The resolutions from all quarters that have been showered upon the Prime Minister and the Secretary of State for Home Affairs, and the important pronouncement made by the Archbishop of Canterbury in the House of Lords, must have gone far to achieve the object in view. It should certainly be possible for the British Government on the next occasion to instruct its representative at Geneva that British opinion is definitely and positively interested in the question of reform.

CALENDARS OF ANTIQUITY

By Jotham Johnson

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STUDENTS of calendar reform find a natural fascination in the calendars of antiquity. And in this field of history, the researches of archeology are gradually bringing to light a good deal of information which has hitherto been hidden and speculative.

For instance, the famous Egyptian calendar, which came into being by good management as much as by good luck, and staggered through a cycle which its own sponsors never measured correctly. It was not the best calendar ever devised, nor the worst—and neither is its direct descendant, our own present calendar.

There were only three natural time periods on which practical calendar systems of ancient times could be based—the solar day, the synodic month, and the tropical year.

It is true that a few ancient scholars attempted to assemble calendars based on the movements of the naked-eye planets—Mercury, Venus, Mars, Jupiter and Saturn—but these ambitious workers regularly ended up in labyrinths of astrological speculation.

The time-periods, then, which had to be dealt with by practical calendar makers were:

1. The solar day, defined as the interval between two successive passages of the sun across the meridian. This varies slightly; the *mean solar day* is the equivalent constant. In studying early calendars we need not distinguish between them.

The sidereal day, defined as the interval between two successive passages of a given star, is about 1/365 shorter than the solar day and does not figure in the study of ancient calendars. The day may run from sunset to sunset, less often from sunrise to sunrise; advanced cultures count from midnight; astronomers, who formerly reckoned from noon to noon, adopted the civil reckoning in 1925.

2. The *synodic month*, the variable interval between two successive conjunctions (new moons) or oppositions (full moons). Primitive peoples almost without exception reckoned from new moon, the earliest appearance of the crescent moon after conjunction. The *mean synodic month* is 29.5305877 days. The sidereal month may vary as much as seven hours; the mean sidereal month is 27.32166 days.

3. The *tropical year*, the interval between two successive returns of the sun to the equinox, is now 365.24219879 days but was once somewhat longer; in 500 B.C. it was about 365.24235, in 3000 B.C. about 365.2425 days. This is the solar year by which calendars are regulated. The sidereal year, the interval between two successive returns of the sun to a given meridian, is 365.25636 days; it played no intended part in systems of chronology, but as we shall see it must be taken into consideration in calculating the Egyptian cycles. The anomalistic year, or period between two successive returns of the earth to perihelion, need not concern us here.

In the absence of a common denominator, one of these units had to be chosen in which to express the others. The day, which grasps our waking

lives in its rhythm, was the universal obvious choice. Some primitive races had no greater unit. On a higher rung of civilization's ladder stand other groups who count in months; but in certain tropical and sub-tropical regions where agriculture appears as an accident rather than as the hard-won profit of planning and human effort, the years may roll by unheeded, and in the race-memory of the Greeks the myth of Demeter, Hades and Persephone looked back to a most ancient past when the cycle of seasons had been imperceptible or inconsequential.

All the races who were forced by climate or geography to recognize the yearly change of seasons had ultimately to choose between calendars of three types: one based on the moon, the second attempting to harmonize the cycles of moon and sun, the third based on the sun alone.

Obviously, nothing hinders us from counting up to infinity in lunar months, and some will so explain to you the great age of Methusaleh, as measured in months, not years. As a rule, however, tribes so primitive that they ignore the passage of years cannot count beyond ten, fixing a period of months which we may call a year. Among a few peoples, early Rome possibly included in their number, extension of this practice gave a sort of lunisolar year consisting of ten lunar months followed by a blank period—conveniently, the depth of winter—equal to two or three months; others have years of eleven months; others name, and count, only the months of the agricultural season, still others only the winter months; where there are two rainy and two dry seasons each year, *i.e.*, two complete agricultural cycles, a solar year may include two six-month agricultural "years." M. P. Nilsson has collected the variations on this theme.

The best modern example of a purely lunar year, however, is furnished by the desert Arabs. They depend entirely on observation of the new moon, so that they do not know in advance whether the month will be 29 or 30 days in length. At sunset of the 29th day they watch closely in the western sky for the first slender crescent. If it appears, the new month begins at once; if not, it begins on the following day. In March, 1929, while crossing the Syrian desert from Deir ez-Zor on the Euphrates to Palmyra, I witnessed a practical demonstration of this. Horsemen raced from tents on the horizon to intercept us, not to rob, but clamoring to know if the new moon, ending the painful month-long fast of Ramadan, had been seen at Deir the night before; for it had been cloudy in the desert.

Their year of twelve lunar months, 354.36705 days, varying between 354 and 355 in observance, anticipates the solar year by 10.875 days as the calendar rotates grandly backward through the seasons. This began with the hegira in 622 A.D., and in the 1315 solar years since then they have gained 14300 days or thirty-nine years; and in fact they are now counting the 1354th year of their era.

This calendar appears so natural and primitive that you will be sur-

prised to learn that it came into being artificially. Mohammed, finding a lunisolar calendar in use at Mecca, but the intercalations in the hands of priests who abused them for political ends, created order or rather a more agreeable disorder by forbidding intercalations forever.

Mohammed's calendar made trouble for Arab farmers, who have to learn to sow and reap at new calendar dates each year. Other races could not endure this, but tried by intercalating to keep the lunar dates in some accord with the solar year. This second group, dependent upon agriculture but clinging to the religious festivals which follow the lunar cycle, furnishes the widest variety, the most fascinating range of lunisolar cycles.

If twelve lunar months make a "lunar" year nearly eleven days short of the tropical year, two lunar years would fall nearly 22, three years nearly 33 days ahead, throwing the agricultural program wildly askew unless an extra, "intercalary" month was inserted to bring the two years back into approximate agreement.

Most primitive races did not attempt to fix a cycle in advance, but depended on empirical intercalation. This could be governed by reference to a fixed starting-point, for instance the heliacal rising* of a given star; if for instance the first month was to begin with the first new moon after the heliacal rising of the Pleiades, and if the twelfth month ended before such rising, it was easy to insert an extra month. The equinoxes can also be observed fairly accurately, and in Babylonia by the fourth century B.C. the beginning of the year had been fixed at the first new moon after the vernal equinox. I recently suggested that this held elsewhere, for example among the Nabateans of Arabian Petra, and that two curious obelisks on a hill-top beside the city were a sort of transit to observe the equinoctial sunrise and sunset. Other groups took the summer, or winter, solstice as the beginning of their years, but the solstice is not so easily observed, and we shall see what trouble it got the Egyptians into.

Some think of the intercalary month as repeated, as the Babylonians had their Addaru and Addaru II, the Athenians Posideion and Posideion deuteros ("second"), the Syrian Greeks Dystros and Dystros embolimos ("intercalary"). More primitive groups think of the repeated month as the month to which the name really belongs and ignore the previous month, which thereafter becomes a nameless "forgotten" or "lost" month. Still others, and curiously they seem to be the most numerous, have thirteen named months of which one can be dropped ("extracalated") when necessary to keep the years, lunar and solar, into agreement.

Economic ends did not always recommend empirical intercalation. A good example is Mecca, at whose annual festival pilgrims from all over the Arab world have been meeting since long before Mohammed. Under

* Said of a star's first appearance in the morning sky after conjunction with the sun. This is an important moment, for it bears to the year approximately the same relation as the new moon's appearance to the month.

a system of random intercalation, which might find its customers arriving indignantly at Mecca a costly month early or a month too late, the celebration could not long have retained the patronage to which it owed its existence. Most communities in like situation were ultimately driven to announce their intercalations in advance.

A really effective cycle of intercalations which would fix the calendar many years ahead provided a standing challenge for early astronomers. At this point the Babylonians walked off with all the prizes.

The problem was to find a multiple of synodic months and a multiple of solar years which closely coincide, after which period the cycle might begin again. We may skip a few centuries of trial and error, and note that a cycle of eight years, three of which are intercalary, provides an easy solution, for

5 years at 12 months	60	
3 years at 13 months	39	
	99 months at 29.5305877 days	2923.5282
8 years at 365.24235 days		2921.9388
	Difference	1.59 days

It is hard to believe that so obviously satisfactory a cycle did not pass immediately into general use; but although ancient writers refer constantly and familiarly to the *oktaeteris,* in Greece our scanty evidence rarely permits us to peek behind the curtain and find the eight-year cycle in actual use; the priests apparently retained the right—the duty, perhaps they said—to intercalate at the bidding of the omens; at any rate, all was confusion. In Babylonian chronology eight-year periods appear here and there, but the cycle did not run perfectly smoothly; and indeed in a century and a half its error would amount to a whole month.

Astronomers in Babylonia went ahead to find a better one, and not later than the fifth century B.C. they lit upon a cycle of nineteen years, seven of which are intercalated:

12 lunar years at 12 months	144	
7 lunar years at 13 months	91	
	235 at 29.5305877 days	6939.68811
19 solar years at 365.24235 days		6939.60465
	Difference	.08346 day

At that rate, after twelve cycles, two and a quarter centuries, the lunar year would only be one day out by the sun. No ancient people determined to adhere to a lunisolar cycle needed a better one than that and on the strength of it I take hearty exception to the late J. H. Breasted's statement that "the effort to fit the series of moon months into the cycle of the year was never successful."

We find that Greek mathematicians and philosophers, not perfectly satisfied, wrote learned tomes to promote crackpot 59-, 76-, 82- and 304-year variants on the nineteen-year cycle. Calendar reform was in the

air, and they were concerned not so much to correct it as to extend it to include needlessly within its prophecies the lengths of months, since regular alternation of 30 and 29 days speedily encountered trouble. The Babylonian cycle allowed lengths to be determined by lunar observation.

Such a cycle, however, is tested better in operation than on paper. The *enneadekateris* meets that test magnificently except in Greece, the home of its alleged discoverer Meton. We are told that Meton devised it in 432 B.C. but it seems unlikely that he could have had access, anywhere in Greece at that time, to astronomical records systematic and complete enough for the calculation. In Babylonia, on the other hand, we know that the records were astonishingly complete and an impartial critic may be forgiven, with Fotheringham, for suspecting that Meton merely publicized in Greece what he had learned in eastern travels.

In view of this disagreement we may be interested to compare Greece and Babylonia's haste to adopt it. Fortunately the researches of Meritt cover the generation beginning in 432 B.C. and show, instead of the adoption of the nineteen-year cycle, the greatest irregularity prevailing. The distribution of intercalary (I) and ordinary years (O) in any lunisolar cycle is governed by a simple rule: either one or two ordinary years—no more, no less—must intervene between two intercalary years. Obeying this, a nineteen-year cycle with seven intercalary years must give the sequence

O O I O O I O I O O I O O I O O I O I,

any year of which, be it noted, may be taken as the initial year of the cycle. Nowhere do two intercalary years nor three ordinary years come together. But during the Peloponnesian War we find both these errors.

The next three centuries of Athenian chronology have been more recently subjected to an exhaustive study by Dinsmoor, who found the nineteen-year cycle impossible to trace. Even the eight-year cycle appears no oftener than the laws of chance predict.

Among the Babylonians, on the other hand, the calendar in use through the whole fifth century approached closer and closer to regularity until, in 383 B.C., it crystallized forever in the nineteen-year cycle. From them, as I have shown, it was taken over by the Seleucids who inherited Alexander's empire in Syria, Mesopotamia and points east. Their only change was to begin their year, not with Babylonian Nisannu, the month begun at the first new moon after the vernal equinox, but with Tashritu, the seventh month, since Dios, initial month of the old Macedonian calendar, was associated with the autumnal equinox. Both calendars intercalated the same month, Dystros-Addaru, last month of the Babylonian menology, sixth of the Macedonian.

From them in turn, it seemed to me on scanty evidence, the Parthian kingdom, which came into being about 250 B.C., derived its calendar;

newer material has tended to confirm this. But I did not then know that China's present calendar, which is hardly to be distinguished from it, goes back to the Han dynasty who got it from their contemporaries and correspondents the Parthians.

If we add that the sacred calendar in use by the Jews since 358 A.D. is likewise a 19-year cycle distinguishable from the Babylonian in no major particular, and that the date of our Easter varies notoriously in a nineteen-year cycle dependent on the relation of new moon and vernal equinox, its tenacity and serviceability, its resilience in the face of improvements, are seen to be extraordinary—an honest triumph, not an "intolerable inconvenience" for its discoverers.

The outstanding example of a primitive race which resolutely turned its back upon the moon and based a calendar on the sun's period is the Egyptian. Their whole economy depended on the Nile floods, which begin shortly after the summer solstice.

In the third millennium B.C. they learned the approximate length of the tropical year, and made their year 365 days. At first they intended it to begin at the solstice, a natural New Year Day. Their older calendar, based on the moon as we learn from the hieroglyph for "month," provided twelve suitable subdivisions which they arbitrarily stabilized at thirty days, adding five extra days at the end. Their determination to retain this calendar, in the face of inconveniences it developed, is enlightening.

For they had made no provision for the odd .2425 day. As early as the IVth dynasty we find that they had to observe two New Year Days, the "First of the Year," as scheduled by the calendar, and the "Opening of the Year," when with the arrival of the flood the new agricultural year actually began. Determined to have a fixed 365-day year, they allowed New Year Day to swing backward through the seasons uncorrected. This "great cycle" would end when the cumulative error added up to a whole year, New Year falling once more on the solstice.

But here is the source of new confusion. The Egyptians seem to have thought that this period was $\frac{365.25}{.25}$=1461 years by the Egyptian calendar, 1460 solar years. That is the wrong figure on which Sosigenes based the Julian calendar and the figure commonly given in the handbooks; the correct length of the cycle would be $\frac{365.2425}{.2425}$, which gives us a considerably different period, 1506 calendar, 1505 solar years; but this does not fit requirements either. The fact is, as Censorinus says, that the observation which foretold to the Egyptians the arrival of the flood, the natural beginning of the year, was not the solstice but the heliacal rising of Sirius, which they called Sothis. This was preferred because it was more easily observed than the solstice; and between 2900 and 2700 B.C.,

while the Egyptian calendar was forming, it varied only a day or two from the solstice; no one was in a position to predict that it would change in a 26,000-year cycle of its own. Actually, however, thanks to the precession of the equinoxes, the heliacal rising of Sirius was falling later than the solstice at the rate of one day in about 120 years, so that the true Sothic cycle was not 1505, not 1460 but 1456 solar years—1460 being so near right that it fits some of the evidence.

Censorinus tells us that in 139 A.D. the heliacal rising of Sirius on Thoth 1=July 20 by the Julian calendar (July 19 Gregorian, 25 days later than the solstice after three thousand years) ended a cycle and began a new one. Two 1456-year periods back put the beginning of a cycle in 2774 B.C. This cycle ended 1456 years later, 1318 B.C. to be precise, four years earlier than the astronomers of Ramses I's sophisticated court perhaps expected. A pitfall: we can almost hear them sniff, and accuse their remote predecessors of poor observation; yet in 1314 B.C. Thoth 1 was only one day soon, and after a millenium and a half of turbulence who would have expected the original data to survive? And possibly similar considerations led them to overlook a repetition in 139 A.D.

Most authorities, including—worse luck because they reach a wider audience—the encyclopedias, give 4241 B.C. as the date of the establishment of the Egyptian calendar, "the earliest fixed date in history." Three 1460-year periods back from 139 A.D. would in fact give 4242; Breasted accepts Borchardt's date of 4236 B.C.; three periods of 1456 years would actually take it back to 4230 B.C.; but I consider such a date most unlikely. I find it hard to believe that men whose other attainments were so limited had carried astronomy so far, or that there was a government in fifth-millenium Egypt organized enough and centralized enough to be interested in promoting over the jealous opposition of the priests a universal calendar. And I am troubled by the fact that in 4230 (or 4236) B.C. the heliacal rising of Sirius occurred a week before the solstice.

The great argument in favor of going back one whole cycle from 2774 (or 2776) B.C. has been that the Pyramid Texts, presumably older than this date, refer to the intercalary days of the year's end; and admittedly the cycle could have begun only when Thoth 1 coincided with the heliacal rising or solstice. There is no place to stop between 2774 and 4230 B.C.

But there are several ways out of this. Let us assume, for example, that about 2900 B.C. there was instituted in Egypt a calendar of twelve thirty-day months with a certain number of days—in practice five or six—empirically intercalated, the new year beginning with the heliacal rising of Sirius when observed, at that date coincident with the solstice. If it did not appear on the 366th day, it presumably would be observed on the 367th. This explains why the Egyptians, whose calendar depended on this observation, began their day at dawn, while the Greeks who

like modern Arabs depended on the new moon, began theirs at dusk.

Wearying, after a century or so, of adjusting the length of the year empirically, the Egyptians decided, simply, that a fixed 365-day with its disadvantages was preferable, and at that point, 2774 B.C., Thoth 1 and the heliacal rising (still thought to be synchronous with the solstice) began their slow cycle of divergence.

This or some similar explanation appears to be infinitely preferable to a 43rd-century date for the inauguration of the Sothic cycle. A date in the fifth millennium has after all been retained largely for sentimental reasons because (a) it appears to give Egypt definite priority over the old archaeological rivals in Babylonia, and (b) it appears to be a crushing comeback to the Bible Belt and Bishop Usher's date of 4004 for the creation —how long is it since such an answer has been needed?

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OBITUARY NOTES

BISHOP WALDEMAR AMMUNDSEN, head of the European Section of the Universal Christian Council, died in Denmark on November 30. Born in 1875, he became Professor of Church History in Copenhagen University when he was 26 years old, and six years later published the first of a series of Lutheran studies which won him distinguished recognition throughout Europe and America. After the World War he devoted himself largely to international problems and the advancement of church unity. He had long been an advocate of calendar reform, and was prominent in bringing this subject to the attention of the world churches through the Universal Christian Council.

MME. CELINE VILLEMIN, president of the Cercles des Annales, a French-American Society, died on September 14th. Mme. Villemin had been interested in the subject of calendar reform as a means of bringing a better understanding between peoples.

OTHER deaths among the membership of The World Calendar Association during the past few months included: Hon. James Couzens, senior United States Senator from Michigan; Mme. Ernestine Schumann-Heink; Mr. John E. Gratke, managing director of the Broadway Association; Dr. John H. Logan, Superintendent of Schools, Newark, New Jersey; His Eminence Louis Cardinal Maurin, Archbishop of Lyons and Primate of France; Dr. Herbert C. Dana for 14 years chaplain of the Metropolitan Hospital on Welfare Island.

SENSIBLE TIME RECKONING

By E. B. TRANEUS

(Translated from an article in Sunt Förnuft, Stockholm)

OUR GOOD old Gregorian calendar is ripe for revision! This is probably news to many Scandinavians as with the exception of a recent radio lecture very little has been heard of this matter in our country. But so much has been written and spoken about it in other countries that it seems only proper that we too should get acquainted with the proposed reform of our calendar.

The object of the revision is to save time—certainly a worthy motive. It is indeed the same motive that actuated the revisions made by Julius Caesar in 45 B.C., and by Pope Gregory in 1582. The latter was the most recent reform of the calendar.

And now, we reiterate, the time is considered ripe for a new revision of time reckoning. The first proposals for this reform were made 100 years ago, but it is only in the last two decades that real progress in this direction has been made. Just before the World War, the international congress of Chambers of Commerce came out in favor of a revision of the calendar, and the discussions thus started continued on an international platform after the war. Ten years ago the League of Nations took up the question, and since then the field of activity has constantly widened. There exists an international committee in Geneva, a "World Calendar Association" in New York, and organizations for the study and promotion of calendar reform in a great number of countries.

What, then, are the objections held against our present almanac? They can chiefly be summarized as follows:

First, the calendar year is not evenly divisible into weeks but contains 52 weeks plus 1 day, and 2 days during leap year. As a result of this, the month-dates and week-days do not coincide from year to year, which causes many inconveniences. The critics, therefore, are striving to get all the years to begin on the same week-day.

Second, the months cannot be arranged in half-years and quarters of uniform length. The first half year has 181 days and the second 184. The four quarters have 90, 91, 92 and 92 days respectively. The varying lengths of the months and their unsymmetrical placing within the year, are considered relatively easy to remedy.

Third, months have a varying number of days. February, for example, has only 24 working days, while other months contain up to 27. This is considered a very serious inconvenience, but is one simple to correct.

Fourth, Easter wanders between March 22 at the earliest and April

25 at the latest, varying over a period of 35 days. This can be adjusted on the basis suggested by the British Parliament.

Many proposals for a new calendar have been made. The League of Nations has considered almost 1000 such proposals. However, only two reform proposals have survived the League's scrutiny—the so-called "International Fixed Calendar" of 13 equal months and the "World Calendar" of 12 months divided into equal quarters.

The 13-month plan is the less practical of the two proposals. While it would eliminate some of the disadvantages of our present calendar, a year of 13 months involves many drawbacks. The number 13 is awkward and not evenly divisible by 2 or 4. A 13-month calendar would not have any readily-available half years or quarters. Computation of interest and rents would be made more complicated than ever. Reports, statistics, invoicing and periodic meetings, which by age and custom are monthly, would involve added work because of the extra month.

For plenty of reasons, a reform along these lines of the 13-month proposal seems to be out of the question, in spite of the fact that it has been energetically propagandized.

The World Calendar, however, looks more practical. It proposes four identical quarters, each containing exactly 3 months or 13 weeks or 91 days. Every quarter begins on a Sunday and ends on a Saturday. Every month has 26 working days. This has been achieved by giving the first month in each quarter 31 days and the two other months 30 days apiece, making 364 days per year.

To make the calendar perpetual—that is, identical for each year—a zero day is inserted between December 30 and January 1. This day is to be considered as an extra holiday, and the same would be the case with the quadrennial "leap-day," which would be inserted between June 30 and July 1 every fourth year.

Thus, according to this World Calendar, New Year's Day always falls on a Sunday. Supporters of this reform plan its adoption beginning with the year 1939, which year commences with a Sunday. The transition could then be accomplished with the least complications. The next time that a year will commence with a Sunday will not be until 1950.

It must be agreed that a calendar of this type is very simple and attractive. The children can learn it in school like the multiplication table, and each year will be like the next. The half years and quarters will also be uniform. No time will have to be wasted in advance figuring, when it concerns the week-day for a certain date or vice versa, as these will coincide every year so that, for example, May 14th will always fall on a Tuesday and September 30th always on a Saturday.

Finally, if Easter is fixed, a truly constant, perpetual calendar will have been accomplished—one indeed which is both practical and scientific.

It is, of course, impossible to estimate how much time is wasted annually in the study of calendars and almanacs, in the effort to keep track of the ever-changing connection between month-dates and week-days. It is strange that people who in other respects have insisted upon an ever-increasing exactness in measurements of many kinds, seem to have been content with a time reckoning which is irrational and unsymmetrical.

Aside from certain astronomical facts over which we have no control, it is really rather surprising that our times, which are so insistent upon standardization and rationalization, are satisfied with a monthly division, the irregularities of which go back to the idle caprice of a Roman emperor who lived nearly 2,000 years ago!

It will be observed that in the proposed new calendar Christmas Eve always falls on a Sunday. In this way, three consecutive free days at Christmas are obtained. Midsummer's Eve, a popular holiday in Scandinavia, will always fall on a Saturday, which also might bring with it consecutive free days for rest and recreation. The significance of this regularization of holidays in such matters as the planning and carrying out of holiday traffic by railroads, steamships and bus lines, should be clear to everyone.

The planning of the curriculum for our schools is an annual task of huge proportions, which must be repeated every year so that holidays and other free days can be fitted suitably into the scheme. With a perpetual calendar as a basis, this work can to a great degree be performed once for all, with a saving of time and mental labor for all educators and educational authorities.

A perpetual calendar would mean enormous savings in printing, in bookkeeping, in law, banking, accountancy and many other fields.

On the whole, each one of us in our own sphere of work can bear witness to the fact that the ever-changing calendar causes considerable extra trouble which we would be thankful to escape. For that reason, no serious objections ought really to be made to a reform of time reckoning along the lines of The World Calendar. I am sure the proposal will be greeted with general approval by Swedish public opinion.

STUDY BY WORLD STATISTICIANS

EMINENT statisticians, meeting in Athens, Greece, early in the autumn for the biennial sessions of the International Statistical Institute, ordered a formal and complete study of calendar reform to be made by the Institute's Committee on Transportation. The action of the Institute was inspired by Dr. Hans Platzer, director of the Statistical Bureau of Germany, and by Prof. W. F. Willcox of Cornell University.

LOOKING BACKWARD

By LATROBE CARROLL

LET'S do a bit of pretending. Like the hero of H. G. Wells' story, "The Time Machine," we have gone, let us say, on a sudden journey into the future. We haven't rushed forward very far—just far enough to give us perspective. Having turned a dial on our time machine, *whisk*, we have landed right in the middle of 1955: a date we chose at random.

We happened to find ourselves in a town of moderate size. Moreover, we were in the home of the Blakes, though quite invisible to them. Nice people, the Blakes—we realized that at once. There were, it appeared, four in the family: John, Edith, and their two children: Nancy, an intelligent eleven, and Tommy, a likable nine. Plainly, some sort of tea-time celebration was on; it turned out to be the Blakes' wedding anniversary. And there were guests: Bill Marshall, his wife Julie, and a daughter, Gwen.

The living room was pleasing in its simplicity. There was no aimless clutter in it, though a chest stood near the center of the floor with the casual air of having been placed there just for the occasion.

Abruptly, Tommy Blake made a dash for the chest. "I'll be the one to open it!" he cried. The lid flew up under his eager hands.

Everybody gathered around. Tommy's fingers were busy in the box. He pulled out an odd-looking object which he held up, challengingly, before Gwen's eyes. "Bet you don't know what *that* is!"

"Oh, but I *do*," the little girl protested. "It's a bustle. And I know how women used to wear them."

She proved this by putting it at her back and tying it around her waist.

A tag, with lettering on it, dangled from one of the bustle's wires. Marshall leaned forward and read, aloud, "Relic of a foolish fashion: flourished in the eighteen eighties." Straightening, he announced, "Now I see what all this is. It's the Blakes' own private museum."

"Right," said John Blake. "It's our family tree of absurdities. And we add to it from time to time. Whenever we find ourselves using anything ridiculous, in it goes. That bustle belonged to my wife's grandmother. And this"—he lifted out a mustache cup—"had the honor of keeping Great-Uncle Henry's mustaches out of his coffee."

It was Nancy who next pulled out a woman's flannel bathing suit. Its skirt must have almost reached its wearer's ankles. There were black cotton stockings and round garters to go with it. The next grab brought out a whalebone corset and the next a hoop skirt.

"It's *my* turn now!" Tommy lunged, and produced a woman's leather belt, frayed at the edges from use. His father took it from his hand with, "See here, Marshall! I'll show you something interesting." Blake put the

belt around his head. "Look. It exactly goes round my skull. The woman who wore it laced so tightly that a man's hatband could have circled her waist. Painful thought. . . . How did the race survive, anyway?"

Blake began to grope downward into the box. "I want to show you the gems of my collection," he said, and drew out a large package wrapped in tissue paper. "A relation of mine designed some of 'em," he added.

Presently the contents lay revealed: *calendars* in a tight mass—large, small, almost all sizes, some plain, some adorned with gaudy pictures. Blake spread them all out on a table with slow, careful fingers.

"Whatever are they, anyhow?" Gwen cried. Then, realization dawning, "Don't tell me. I know. I've heard about them. People had to have a fresh one every year. They called it 'this year's calendar,' and threw the old one away. Wasn't that a dizzy idea?"

Tommy had been making impatient noises and, now, words burst from him. "Yep, and they used to tell time by hour glasses and sun dials. And they rode in stage coaches and sniffed snuff." He gazed at the litter on the table. "I'll bet the same ones that wore hoop skirts and took snuff liked going by those old calendars. Why, take Easter—" He halted, uncertain. "Wasn't there something mixy about old-time Easters?"

"Yes, Tommy," said Marshall, dryly. "It used to wander."

"Please let *me* tell the rest." It was Nancy, pleading. "I learned it at school and remembered it because it was so funny and silly. Easter could bob up anywhere between March twenty-second and April twenty—"

"April twenty-fifth," Blake supplied. "It slipped and slid, from year to year—"

"Till they could hardly catch the Easter bunnies." A giggle from Gwen.

Nancy was determined to tell more. "And Christmas and Fourth of July and birthdays came on different weekdays. All higgledy-piggledy."

"Don't forget marriage anniversaries," Julie Marshall said, "because one brought us here."

"Sure, mother and father got married on a Saturday," Tommy volunteered, "and, now, their anniversaries always come that same day."

Julie nodded. "But with the old-fashioned calendar, no matter what day people married on, paper and tin and silver weddings, and all the others, often just got lost in the business rush. Husbands forgot."

Blake walked over to a desk and picked up something that seemed almost a part of it: a World Calendar. On its simple stand, with its look of permanence and dignity, it was a work of art. He set it at the edge of the cluttered table with an air of satisfaction. His wife smiled at him and waved a comparing hand. "Those poor, fumbling old calendars. They do actually look medieval. But, really, it wasn't so long ago—"

"*How* long?" Gwen demanded.

"Why, don't you know?" Nancy said. "The new ones began in 1939."

"Because Sunday was on January first that year," Tommy cut in. "And people had a whopping celebration—in America, England, France, Germany—and lots of places. They were glad to get together on something."

Blake nodded in agreement. "But don't forget the protest meetings, son. Some people thought the calendar-makers were monkeying with time. They didn't realize that no calendar can take a single second from a life."

"And they weren't the only objectors"—from Marshall. "Remember what a howl the die-hards made about the labor of changing statutes and contracts? Funny, isn't it, how big a bugaboo looks till you tackle it? All it really amounted to was a little clerical work. Any schoolboy could convert the dates of the old calendar into the dates of the new one."

Nancy turned a small, eager face toward her mother. "But nineteen thirty-nine wasn't the only chance to change the calendar, was it? I mean, there'd been other years when it could have been put right?"

"Oh, yes," Edith Blake admitted.

"Well, then, I think grown-ups were kind of dull. Duller than they are now. How could children—I don't see how—I mean, how could they look up to their parents when older people just didn't have—"

"Any sense?" her mother suggested. Nancy gulped and nodded.

"Heh! Be fair, Nan." Blake's voice was light but his eyes were grave. "Admit that, if you'd lived in those times, even if you were grown up, you might have helped the old way to stick by not rolling up your sleeves and working for the new one. You might have been so busy with your own affairs that you'd have left such things to the other fellow—and wouldn't have bothered about whether they got done or not."

"Well . . . I s'pose . . . maybe—" said Nancy with tactful vagueness.

"I really don't believe," Blake brought out slowly, as if debating with himself, "that our forebears were less intelligent than we. The cleverer men and women in any age can see that changes ought to be made. But there's nothing more slow-moving than masses of people."

As Blake reassembled his special treasures Marshall's eyes rested on them. "I know it's ancient history, but wasn't there some discussion, 'way back, of changing to a thirteen-month calendar?"

"Yes. Plenty of talk, though it's long since forgotten. The plan had some points. But it was too drastic. The old Gregorian calendar was sick, but the thirteen-month year as a cure—was worse than the ailment."

He was wrapping up his old calendars as if they were precious plate. "Valuable, most of these," he commented. "Real collectors' items. And every year that passes puts their price higher. Dealers have been snapping 'em up. But the best thing about them—and this whole box of junk—is that they teach our youngsters the world *does* move. Slowly, of course—takes a lot of pushing. But we all must learn to help in the pushing."

ROMANCE OF THE CALENDAR

By P. W. Wilson

In this issue, the seventh chapter of Mr Wilson's discussion of the Romance of the Calendar is published. A book by Mr. Wilson, under this same title, is to be published immediately after January 1 by W. W. Norton & Co., New York. It is described by the publisher as "the most important book on the subject which has ever been attempted." The book will sell for $3, and will be published simultaneously in London. It has been more than two years in preparation, and its authoritative character is testified by the fact that Mr. Wilson in a prefatory note acknowledges the assistance of such eminent experts as Lord Desborough, Bishop Manning, Dr. Edward S. Schwegler, Prof. C. C. Wylie, Dr. Henry W. Bearce, Captain J. F. Hellweg, Dr. Hans Platzer, Dr. Alfredo de Castro and Rabbi Weitz.

CHAPTER SEVEN: TRIUMPH OF TWELVE

IF WE WISH to understand the early development of the calendar, we must endeavor to visualize what was the life actually lived by primitive man. Let us look backward into the remote stone ages when civilization was in its infancy. There is the Palaeolithic or earlier era. There is the Neolithic or later era when man used spears and hammers and other tools—when he lived in a house and was buried in a tomb—when, as a farmer, he tilled the soil and kept flocks and herds—when, as an artisan, he spun thread, wove cloth and moulded pottery. It is to this man that we owe the origination of the method of measuring time.

Between the life of the Neolithic man and the life that we live today, there was a contrast which can be expressed in terms that are at once simple and comprehensive. We live under cover. He lived out of doors. That was the difference which included all other differences. Some of us live in the country, others of us live in the towns, but the amenities of our existence, whatever our domicile, tend to become more and more urban and less and less rural than they used to be.

The change has been rapid of late, it envelopes us on every side, and little do we realize as a rule to what an extent, especially in cities, we are sheltered from the elements around us. It is not only in the home that we have a roof over our heads. Our means of transport—automobiles and trains and ships and even airplanes—are enclosed against wind and rain and snow and shine.

By artificial devices of every kind, we counteract the vicissitudes of our environment. Windows are so constructed that at will we can admit or exclude the rays of the sun. So powerful are our lamps that we need never be in the dark. We are warm when it is cold. We keep cool when

it is warm. Nor are the noises that we hear to be described as natural noises. The singing of birds, the bleating of sheep, the lowing of oxen, thunder itself are remote from our cacophonies. It is the clatter of machinery, moving or stationary, that fills the modern orchestra with a syncopation that does not change all the year round. Why need we worry about summer and winter? Cannot we follow the seasons, hither and thither, over the surface of our planet, wintering under the sun and enjoying a summer where the landscape is glorious with ice?

How was primitive man situated? There might be some kind of a roof over his head but, at best, a mere umbrella was all that he had to carry with him. What glass was there in his windows? What light was shed by his lamps? What heat radiated from his open fire as the smoke rose slowly through a hole in the rafters or by the tent-pole that served as the only chimney? Such folk could not fly from the inclemencies around them to any Riviera. They had to submit to whatever discomforts and dangers the weather inflicted on them. How they shivered when there was frost! How they sweltered when the heat was sultry!

It was no wonder, therefore, that primitive man was more acutely conscious of climate than we need to be. Not enough was it for him to note the phases of the moon and count the days in each successive lunation. The months, thus equal in length, were by no means uniform otherwise. In some, there was much light and little darkness. In others, there was much darkness and little light. Some of the months were wet and stormy. Others were bright and warm.

To the moods of the months, the environment around man's habitations was immediately responsive. Trees which had been brown and bare, would break forth into leaves and array themselves in blossoms. Grass would grow into fresh green, and birds would build nests, lay eggs and rear their young. What then was the meaning of a variety thus awful in its entrancing but formidable fascination? Why was each month as a new chapter in the volume of the centuries?

Man as a child learning to talk found names for the beasts of the field and the flowers of the forest. So did he name the months. In the Mesopotamian Valley, so it is believed, such names were applied six thousand years ago, and we may see for ourselves how the months were distinguished by Abraham, Isaac and Jacob and their contemporaries. Forty-three centuries ago—that is, some centuries before the call of the Patriarch—the Nippurian months—a more popular term would be Chaldean or Babylonian—had these names. August-September was *Mas-Azag-Kur,* or month for eating tender kids that were fit for sacrifice, and a reminder of this name is found in a Biblical incident when the mysterious and angelic strangers visited Abraham in his tent, to be entertained with just such a kid, "tender and good." March-April—*Itu-Su-Es-Sa*—was the

month for utilizing machines for irrigation. July-August—*Se-Gur-Kud*—was the month of the barley harvest. So we might proceed through all the months in their rotation.

It is a far cry from the Chaldea of sixty centuries ago to the scattered archipelagos of the South Pacific Ocean in our own day. Yet those islands tell the same story that we read in the dim annals of the Euphrates Valley. Are not many of the natives living at this moment within the era of polished stone? Are they not using their calendars under conditions that are still primeval?

We spare a glance for the Fiji Islands and see the people setting up moon-sticks as monthly tallies whereby they may reckon, among other matters, their wages. Off the coast of New Guinea, the Trobriand Islanders are no less calendar-minded. They recognize the phases of the moon, describing the new moon as "unripe" and the full moon as "high". The period when the moon cannot be seen by human eye is known as "the great darkness". During high moon, five days are honored by separate names, and as the moon wanes, six other days are honored by special names. When the moon is at the full, three days are celebrated as a festival. But when the moon is lost to view, no day has a name. It is a period when the calendar is in abeyance.

On the Trobriand Islands, there are unclad astronomers who, with wandering eyes, watch sun and stars, as well as the moon. Yet they fail to perceive any orderly relation between the celestial bodies. As meteorologists, they are content to discern a magic of evil in the sun and a magic of good in the rain.

It is as meteorologists that the Tonga or Friendly Islanders have applied names to their months which signify little yams, yams with small protuberances, early rain, late rain, putting forth living shoots, dead shoots, laying earth, storing yams, time of rotting yam seed, full leafiness, yellow heads on fish, throwing soil on branches or banking soil over yams, using a mere cocoanut shell as a basket at time of scarcity when only a small receptacle is needed.

In the ancient Japanese calendar, we find that there were 24 half-monthly periods in the year, each with its name and each name related to the occupation of the farmer. The series began in February and is as picturesque as all things were in old Japan. We have:

Rise of Spring, Rain Water, Awakening of Insects, Vernal Equinox, Clear and Bright, Cereal Rain; Rise of Summer, Little Filling, Grain in the Ear, Summer Solstice, Little Heat, Great Heat; Rise of Autumn, Limit of Heat, White Dew, Autumn Equinox, Cold Dew, Frost Fall; Rise of Winter, Little Snow, Great Snow, Winter Solstice, Little Cold, Great Cold.

There were similar names for twenty-four half-months in China.

To name the months was a step—at first, a tentative step—to counting

them. Among the Tongans, the word for year is the same as the word for yam, and the period, in so far as it has been definite, may be described as the routine of the gardener. Five unripe moons and five ripe moons are sufficient for the growth of plants and little importance is attached to intermediate months. If the crops are early or late, it will be said that such and such a district has "silly" time, which irregularities are corrected by an annual phenomenon that never fails. From May to November, the prevailing wind blows south and east; from December to April, the prevailing wind, known as the monsoon, blows north and west.

Thus began to develop the idea of a year of moons, a seasonal year, and it is interesting to observe that the American Indian, brought into contact with civilization more highly elaborated than his own, has applied seasonal names, as in primitive times, to the Gregorian Calendar itself. To Hiawatha, names like January and February and the rest meant nothing. The Indian thus speaks of Cold Moon, Hunger Moon, Crow Moon, Thunder Moon, Green Corn Moon, Harvest Moon, Hunting Moon, Frosty Moon, and Long Night Moon. He adopts the measurement of time which is general in modern countries, but he still thinks in terms of what Longfellow called the forest primeval.

In his endeavor to count the lunations, man came to be conscious of a peculiar and mystical intimacy between the moon and himself. There was a period that was preparatory to his own birth. It was approximately 280 days, and the Iranians, dwelling near the Caspian Sea, calculated a month of 28 days—four times seven—so arriving at 10 months as the period in question.

So developed the conception of a year—that is of an arrangement of the months in an order larger than themselves. The year was intended to be a cycle of months—of lunar months. It was a schedule in which months of the same characteristics would recur in a regular sequence.

To this day, there are calendar reformers who ask how many months should be fitted into a year, and this is one of the earliest questions that perplexed the mind of man. It is a question that far antedates what usually we define as recorded history, and the answer is also prehistoric.

If there ever was a choice, it lay between twelve and thirteen months for the complete year. The idea that thirteen is an unlucky number has long been familiar. People do not like to dine at a table where thirteen are seated and there are ocean liners where no cabin has the number thirteen. Usually the prejudice against thirteen is attributed to the scene at the Last Supper of Our Lord when thirteen, including Judas Iscariot, were present at the Table. But Mr. H. G. Wells in his *Outline of History* suggests that the advantage of twelve over thirteen was inherent from the first in the numbers themselves. Describing the culture of Neolithic man he writes: "He was beginning to use tallies and wondering at the

triangularity of three and the squareness of four, and why some quantities like twelve were easy to divide in all sorts of ways, and others like thirteen, impossible. Twelve became a noble, generous, and familiar number to him, and thirteen rather an outcast and disreputable one."

Thirteen is a prime number and thus indivisible into factors. It would not be easy to pack thirteen eggs in a box without wasting space; twelve eggs can be packed three by four or six by two. Hence the practical unpopularity of the number thirteen.

In Funk and Wagnall's larger dictionary, there are exhaustive lists of weights, measures and currency, running to many columns of close print and covering every standard of such reckonings of which we need take account, whether ancient or modern, eastern or western, civilized or barbaric. We find that the numeral eleven is used in linear reckoning—1760 (11 x 160) yards make a mile—and very awkward it is. But we do not find a record of one important instance anywhere in the world at any time of thirteen serving as a numeral for measurement. In Siam an oil measure called the bota equals 26 or twice 13 Maneh. A wool measure in England called the wey equalled 6½ or half thirteen tod. In Ireland, there used to be a coin valued at thirteen pence and known as a "thirteen" or "thirteener." That is about all.

The baker's dozen of 13 loaves is not pertinent. Dozen is the colloquial English for the French *douzaine* or twelve, and the addition of one to the number merely indicates that thirteen are sold as twelve for the advantage of the buyer. It is not a count but a discount that is here indicated, and it may be compared with a quire of paper which contains 24 sheets or two dozen, with one sheet occasionally added to make 25.

In telling the story of the calendar, a year of twelve months is the only year that we have seriously to consider, and the number twelve, as we contemplate its uses, is seen to be of an eternal importance. Despite all decimal systems, there are twelve inches to the foot and twelve pennies to the shilling. So has it been with the clock and the calendar.

They who have played the ancient Chinese game of Mahjong do not need to be told that the tiles in the wall include four winds and four seasons. We cannot escape from these ultimates of direction—north, south, east and west, nor can we escape from the ultimates of the weather —spring, summer, autumn and winter. Some would add that there is a Trinity from which we cannot escape—father, mother and child—the three-in-one which must ever be the unit of the race—four times three make twelve.

The number of the sons of Jacob was twelve. The tribes of Israel were twelve. Around the Tabernacle in the Wilderness, the twelve tribes were encamped in four groups of three, and on the heart of the High Priest lay the breastplate with twelve precious stones on which the names of the tribes were indelibly engraven.

A year of twelve months is thus the year that man, in all eras of his history, has tried to perfect. In any narrative of the calendar, no other year than this is of significance. After patient experience, man realized what was essential and what was merely accidental to that year. Despite all delays and blunders and absurdities, man has never doubted that a perfect year was worth whatever trouble might be involved.

RECENT CALENDAR RESEARCH

Clocks and Calendars

By Mrs. E. A. Stockwell

IN the complex life of this modern age, our clocks and calendars have become quite the most important of all our lares and penates. We literally live and move and have our being through their aid and guidance. Our first thought on awaking each morning is of the hour of day, and our second thought is of the day of the week.

For centuries now the civilized world has used the Gregorian Calendar, which is quite the most perfect instrument of its kind that man has yet invented. Slight improvements are now proposed to make it still more perfect, without altering its fundamental merits and adequacies. The main problem, of course, is to coordinate the days of the week and month.

To those who are internationally minded, it is heartening and noteworthy to observe the progress that calendar reform has made during the past few years. The movement for a revised calendar is world-wide in scope, and efficient agencies are working toward it in Europe, Asia, North America and South America.

In the proposed World Calendar, the nations will unify as well as improve the calendars of the entire world. The achievement of this aim is a great step forward in international cooperation that will result in better understanding and good-will. It is the greatest step of this kind since the world-wide agitation that preceded the establishment of the International Postal Union—which was the first important project between all the nations.

Retention of the 12-month year makes the transition to the new calendar comparatively easy and simple. The adoption of The World Calendar would seem to be inevitable.

Women's Activities

By Margaret Becker Kulp
Sec'y, Women's Council for Calendar Reform

AMERICAN women have lately shown an increasing interest in proposals for revision of the Gregorian Calendar. Membership in the Women's Council for Calendar Reform now includes committees in 30 states. Among the leaders of these groups are representatives of the General Federation of Women's Clubs, the American Association of University Women, the League of Women Voters, the National Educational Association, the League of American Pen Women, the Congress of Parents and Teachers and the Daughters of the American Revolution. The National Story League passed a resolution at its latest meeting advocating The World Calendar.

More and more is the subject of calendar reform becoming a favorite for club programs. Several state and county federations are making intensive studies of calendar reform through committees or groups, and the reports of these groups naturally become the basis for study programs in their subsidiary clubs.

Women are naturally interested, not only in the social aspects of calendar reform, but also in the romantic and poetic background of our time-reckoning system.

"I have given two lectures on this subject recently," says a letter which has just come to me from a Nebraska club leader. "One was before a forum of teachers, young married folk and young business women. This audience was keenly interested, and took part later in an animated discussion of various phases of the subject. My second talk was before a Rotary Club, which paid me the compliment of rapt attention, and paid The World Calendar plan the compliment of complete and unanimous endorsement."

Sane and Simple

By George M. Thomson

WHAT splendid visions does the phrase "a fixed calendar" summon! Visions of a regularized, rationalized, standardized time-world, in which human reason will have triumphed over the brute facts of human prejudice and historical precedent, in which the shape of things to come will have lost half its terror since we shall always be sure that whatever happens the succession of the days will be the same.

Is such a sane and simple reform at last within our grasp? We deal here with in-

tractable material, liable to defy even the reformer's zeal.

What is the difficulty? Why is it that civilized man hesitates to adopt a reform for which common sense overwhelmingly argues?

Calendar reform attempts to bring regularity into something which is in its essential nature irregular. It is very difficult to provide a neat, even, symmetrical year. Millions of people are now suffering under a changeable system of time computation. The best solution, or at least amelioration, of their difficulties is found in the plan proposed by the League of Nations, a proposal to equalize the four quarters of the year so that each contains three months of 31, 30 and 30 days respectively, and to take the 365th day of the year and set it apart from the rest of the calendar, making it a "Year Day" standing between the old and new years.

Under this calendar every year's calendar would be exactly alike. The advantages are obvious, on the grounds of business convenience, order in economic relations, and certain social benefits, such as the fact that public holidays would always fall on suitable days.

Romance of Almanacs

By Dr. A. S. W. Rosenbach
New York Bibliophile

IN the American colonies during the latter half of the seventeenth century and throughout the eighteenth, there were more almanacs published than all other books combined. Often a man's entire library consisted of a single almanac, which he carried with him in his pocket.

New England had no newspapers in these early days, and the only way the settler could determine holidays, fairs, church meetings and sittings of the courts was by consulting almanacs. These were frequently interleaved by their owners, who then used them as diaries and memorandum books, jotting down from day to day any event which interested them, or making a note of anything they wished to remember.

These almanac diaries are invaluable and interesting today because they reveal to us, in their interleaved pages, a glimpse of the intimate life and actual happenings in the first American homes. Sometimes they are our only source of information.

From the middle of the seventeenth century on, the presses of New England were kept busy turning out almanacs. I believe there were hundreds of thousands of them issued before 1700. Yet strange to say, not more than three or four hundred are in existence today. The greatest collections belong to the Massachusetts Historical Society, The Library of Congress, the New York Public Library, and to the American Antiquarian Society in Worcester.

Who were responsible for the material in these almanacs? Not "spoiled" astronomers, but men of substance whose names counted for something more in colonial life than a doubtful ability to visualize the future.

The earliest known almanac printed in the great city of New York was Bradford's issue for the year 1694, of which two imperfect copies exist. But the earliest one by a New York author survives in a single example. It was edited by John Clapp and published in 1697. Clapp kept a house of entertainment "about two miles without the City of New York at the place called the Bowry."

It was not exactly news to state that the most famous almanacs in America—in fact, the best known in the entire world—were those issued by Franklin in Philadelphia between 1733 and 1766. Franklin took part in drawing up the Declaration of Independence, the Articles of Confederation and the Constitution of the United States, but I think he was more proud of his almanacs than of his great historical achievements. They were quoted throughout the colonies, and translated into many languages. In England they were mentioned in the same breath with the works of Addison and Steele, and in France, "*La science du Bonhomme Richard*" was a topic of conversation in the great salons of that period. These Poor Richard almanacs were better known abroad than any other example of American literature.

Of the almanacs issued from Franklin's press, beginning in 1733 and ending in 1766, no complete set exists. One of the best is that presented by the Curtis Publishing Company to the library of the University of Pennsylvania. Down to 1758 Franklin wrote every almanac himself, adding enough spice to each issue to insure a constant sale.

EXCERPTS AND REVIEWS

Educational Aspects

(From *World Education*, official organ of the World Federation of Education Associations; Prof. Paul Monroe, President; Prof. Uel W. Lamkin, Secretary-General)

THERE is perhaps no single class of persons more plagued with the irregularities of the calendar than those who are connected with schools and colleges. The making of a school calendar is full of difficulties complicated with the eccentric incidence of the holidays, and the impossibility of making Christmas and Easter vacations fall efficiently into the school year. All difficulties are repeated year after year because the whole business must be done over again every time school opens.

The main purpose of calendar reform is to remove the wandering character of the week days so that a given day of any month, say March 1, will always come on the same week day. This is about all that calendar reform plans to accomplish and it is a simple matter which would cause no trouble to anyone. As for educators, it would result immediately in a stabilization of the school calendar. Last year's school calendar would be used for this year and for every succeeding year.

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a "perpetual" calendar. Every year, semester and quarter are identical.

In this new calendar each quarter contains exactly 3 months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 week-days. In order to make the calendar perpetual, identical for every year, while retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30 and January 1 and considered an extra Saturday.

The extra 366th day in leap years, called Leap-Year Day, is intercalated between June 30th and July first. The intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January first, New Year's Day, always falls on Sunday.

The World Calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, co-ordinates the different time-periods, stabilizes religious and civil holidays. As compared with other proposals for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

The international advantages of The World Calendar are obvious. Eastern Europe, which has clung to the old Julian calendar for more than 350 years, desires the reform. India, with its 17 different calendars, Japan, the Moslem nations would certainly co-operate in a general adoption of the new calendar. The movement for revision has already enlisted peoples, churches, and governments everywhere. A reform would certainly make for international union and understanding.

An Ingenious Calendar

(From the *Shoe and Leather Record*, London)

IN VIEW of the necessity of getting many countries to agree together, the matter of calendar reform and Easter stabilization is a very difficult one to deal with. There is no question that a fixed Easter would be of considerable benefit to England. The view seems now to be generally held that there is a better prospect of securing agreement to a fixed Easter if it is a part of a general simplification of the calendar.

Lord Desborough, H. G. Wells, the Astronomer Royal and the Dean of St. Paul's Cathedral are among those who have expressed themselves in favor of a reform of the calendar on the lines advocated by The World Calendar Association. This plan, known in England as the Desborough plan, embodies a per-

petual year of 12 months with four equal quarters. The first month of each quarter would contain 31 days, and all the others 30 days. The 365th day of the year would bear a distinctive name and would be placed in the calendar as a second Saturday. By this simple device, every year would begin on a Sunday, and the same dates in different years would always fall on the same weekday.

One of the advantages of this fixed year is that monthly and quarterly statistics could be more accurately compared than is possible under the present system.

International reform of the calendar on the lines suggested has been brought within the range of practical politics by the recent action of the International Labor Conference, which asked the League of Nations to "resume" its study of calendar reform, and drew particular attention to the equal-quarter plan. The Conference's resolution will come before the Council of the League of Nations shortly and will be referred to the relevant committee with a view to bringing the new calendar into operation on January 1, 1939.

All Years Alike

(From the Spokane *Spokesman Review*)

BECAUSE the number 365 isn't divisible by 7 or by 12, the ancients didn't know how to make up a really efficient calendar. As our present calendar stands divided, the second half of the year is three days longer than the first half; the third and fourth quarters are each two days longer than the first quarter; and some of the months are three days longer than is February.

Moreover, the year isn't twice the same —successive Februarys are not the same. The number of Sundays and the number of work days in a given month vary from year to year. All this makes nearly impossible a rational comparison of costs, earnings, profits and other useful statistics and necessitates much arithmetic that enters into the cost of living, as well as consumes our potential leisure and our potential hours of productivity.

If the year were symmetrically divided, you and I and the dairyman, banker, teacher, merchant and manufacturer would not need to search for a calendar each time a contract is dated, or a mortgage drawn up; when bank interest is calculated, or a court hearing set, or school attendance averaged; when a factory's output or a store's turnover is to be averaged and compared from month to month; when a payroll's monthly total or a workman's per diem earnings for the month must be anticipated; when a dairy herd's milk yield, or a poultry flock's lay is to be checked upon in the study of profits and loss; when a restaurateur's required food stocks or a work crew's needed materials are estimated.

What is a month, if not a unit of measure? And if it is rational to have 28 days in one month, but 31 in the next, why not a week that varies in length from six days to eight? If one February shall have 28 days and the next 29 days, why not measure distance and dry goods with a linear foot that varies, being 11 inches long on Mondays, but 12 on Tuesdays?

Several plans have been proposed to better balance our calendar and to make it as much alike from year to year as the recurrence of leap year permits. Several plans went before the League of Nations for study and for reference to a committee from each member nation, which committees were to present the question of concerted calendar revision to their respective governments and peoples. Then the world depression struck and as several nations' currencies crashed problems so grave arose that this one was brushed aside for a time.

Among those various designs for calendar revision was a drastic one advocating a 13-month year and one left-over day. Its sole advantage appears to be that the months would be uniformly 28 days long. But a 13-month year would not divide into halves and quarters consisting of entire months.

Far more advantageous, in the opinion of many, is the plan advocated by The World Calendar Association and known as The World Calendar.

The excellence of this plan is that it would be always the same, would be simple to remember and would bring about a maximum of symmetry with a minimum of change from our present plan.

In this unvarying calendar, any holiday falling always on one certain week day—such as Thanksgiving day, Labor day and Election day—would occur also on one unvarying date in the month.

CURRENT PRESS COMMENT

London Chamber Support

London Times

The Council of the London Chamber of Commerce has sent to the Prime Minister, the Secretary of State for Home Affairs, and to His Holiness the Pope a resolution which was unanimously adopted at its meeting last week. This resolution says: "That the London Chamber of Commerce, which, after many years of advocacy, saw the Easter Act put on the Statute Book in 1928, is convinced that the fixing of the date of Easter, which would confer great benefits upon trade and commerce generally, can best be made effective as part of a general reform of the calendar.

"The inefficiency of the present system is obvious when it is realized that the same quarters are not comparable for statistical purposes from year to year owing to the varying number of working days in them.

"The London Chamber of Commerce therefore urges H. M. Government to use its influence at the Conference to be held in the autumn under the auspices of the League of Nations, to secure the adoption into equal quarters of 91 days, with New Year's Day undated, and a fixed Easter."

Lord Desborough has undertaken to represent the Chamber's views at the League Conference.

Chile's Leadership

Tampa (Fla.) Times

Chilean proposals for calendar reform have been approved by the International Labor Office at Geneva. The movement has been approved and a committee has been designated to carry it on.

Senor Gajardo Reyes deserves congratulations on this event, since the action in Geneva is the result of his initiative, leadership and enthusiasm.

Growing Awareness

Ardmore (Pa.) Times

Everywhere there is a growing awareness of the inadequacy of the present calendar. People who must deal with accurate calculations, forward-planning or the programming of important engagements find their work complicated by the annoying irregularities and confusing changes of our exceedingly antiquated calendar. The hardships of an outmoded measuring system become increasingly clear in a world made smaller by swifter communications. The inequalities of the calendar are matters which call for adjustment.

Serious Attention

Tampa (Fla.) Times

Whatever one thinks of perennial agitation for calendar reform, it cannot be denied that the latest proposals for a uniform world calendar are receiving serious attention from American groups and individuals of high standing.

The World Calendar Association's proposal of a 12-month equal-quarter (91 days) year has been approved by five national scientific bodies, including the American Association for the Advancement of Science, and the American Philosophical Society.

Veteran Leader

Toronto Mail and Empire

Lord Desborough's interest in calendar reform dates back prior to the World War, when he participated in the beginnings of the movement. He followed its early development in Switzerland and Germany. Then, after the war, he saw it reappear and he sought to enlist British support in Parliament as early as 1920 and 1921. The progress which has been made is indicated by the complete support given to Lord Desborough in the recent House of Lords debate by the Archbishop of Canterbury. No qualifications accompanied the Primate's official utterance.

Near Realization

Frankfort Oderzeitung

Feasibility of a reform of the calendar through the League of Nations is now near realization. Through this reform, stabilization would be obtained in all countries and by all faiths. Replies to a definite questionnaire have been received by the League of Nations and studied. On the whole they are favorable.

JOURNAL OF CALENDAR REFORM

EDITORS

CHARLES D. MORRIS CHARLES C. SUTTER

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ELISABETH ACHELIS, *President*

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OUTSTANDING activities in calendar reform during the year 1936 have brought the movement much nearer its goal. There is every reason to look forward with confidence that the proposal for a new calendar will be brought to the final stage of enactment during 1937.

The first draft of the proposed international treaty, by which calendar reform will be consummated, has been laid before the League of Nations. Consideration of the preliminary steps toward such a treaty will presumably be a part of the program at the meeting of the League's Council during the early months of the year.

Meanwhile, throughout the year, governments have been drawing closer together on the subject. In England, a government spokesman has declared in Parliament that the subject will have "the most sympathetic and serious consideration of the representatives of His Majesty's Government." The London Chamber of Commerce has declared its strong advocacy of calendar reform in a resolution endorsing the perpetual 12-month revision of equal quarters, which has been reinforced by similar resolutions coming from the Federation of British Chambers of Commerce and culminating in the Congress of Empire Chambers recently held in New Zealand.

In Germany, a new committee for the promotion of calendar reform is being formed by the Minister of the Interior, with full governmental approval; and in France, Senator Godart is taking the leadership in the movement in an effort to keep his country abreast with other powers in the advocacy of this much-needed reform. The favored plan is The World Calendar.

In the United States, the endorsement of the Central Statistical Board, which represents technical men in charge of statistical work in various governmental departments, has approved calendar reform and urged an international convention. This action prepares the way for the President to use his great power and influence for setting in motion American cooperation in favor of the reform.

International approval of the movement has also come within the year from labor and the churches. Labor's desire to see prompt action was voiced first by the Labor Conference of American States, at Santiago, Chile, which unanimously endorsed The World Calendar. This was followed by a strong resolution passed unanimously at the congress of the International Labor Office in Geneva in June.

In the religious field, the international organization of non-Roman churches, the Universal Christian Council for Life and Work, completed a four-year study of calendar reform and declared its verdict in favor of calendar reform, a stabilized Easter and the 12-month equal-quarter plan of revision. The clergy of the Roman Catholic Church have shown a constantly increasing interest in, and sympathy with, the aims of calendar reform, and the latter part of 1936 has seen the publication, under the imprimatur of the Church, of the most important book on calendar reform yet issued by the European press—the Abbé Chauve-Bertrand's *La Question de Pâques et du Calendrier*, which fully approves of The World Calendar.

FROM THE MAILBAG

I am very much in sympathy with other members of the Chamber of Commerce in regard to obtaining a reform in the calendar. I am sure that it would help greatly in comparisons in cost accounting in industrial companies. I also think that it would make it possible to rearrange national holidays so that they would fall on week-ends, which would result in a great advantage.—Cleveland E. Dodge, New York, N. Y.

It will give me a good deal of pleasure to familiarize myself with this movement with which I have sympathy.—Rev. W. C. Covert, Philadelphia (Moderator Presbyterian Church).

I am glad to note that such good progress is being made among the large scientific societies of America.—Harlow Shapley, Harvard Observatory, Cambridge.

In my position as Manager of the Portland Depository of the Methodist Book Concern, I have had an opportunity to converse with a great many ministers, as well as laymen, regarding calendar reform. I have found sentiment nearly unanimous for The World Calendar.—J. J. Brauer, Mgr., Methodist Book Concern, Portland, Ore.

I am much impressed by the simplicity of the adjustments required to make a calendar of 12 months with equal quarters.—Prof. R. F. Foerster, Princeton, N.J.

Calendar reform is an urgent need. Where such reform affects the work of the Church, the various national conventions should express themselves. Governments should then enact legislation in best interests of all.—Rev. G. Wickey, Exec. Secy., Lutheran Board of Education, Washington, D. C.

I certainly hope the new calendar can be put into use very soon. I also hope that the revisionists will all try to assist The World Calendar and not waste their efforts debating various types among themselves. Let us take The World Calendar and "put it across."—F. Bolton, Librarian, Yale Univ.

Your calendar is sound, practical and worthy of adoption.—G. A. Gibson, Mining Executive, Bisbee, Ariz.

The 12-month calendar offers the greatest possibilities for a united Christendom. Leadership in this important achievement is clearly the duty of the church.—Rev. E. V. Kuhns, Pueblo, Colo.

I feel that much would be gained by the adoption of The World Calendar and can see no serious objection to it.—R. C. Wallace, Pres. University of Alberta, Edmonton, Canada.

It seems to me that it is an entirely practical proposition and that after a very little while everybody would become so accustomed to it that men would wonder why for so long a time the world was willing to be subjected to the inconvenience caused by the calendar as it is.—Rt. Rev. A. S. Lloyd, Suffragan Bishop of N. Y.

I should like The World Calendar to begin January 1st, 1939.—K. S. Klingenberg, Director of Norges Geografiske Opmaling, Oslo, Norway.

Your suggested 12 months calendar is a vast improvement over present one.—W. E. Champlin, Contractor, Phila.

I am using the JOURNAL to keep our faculty and student body informed on the subject.—H. B. Robison, Culver-Stockton College, Canton, Mo.

Sons of Norway, District Lodge No. 1, in convention assembled, voted to join The World Calendar Association. — A. A. Andersen, Secretary, Minneapolis, Minn.

I favor the 12-month equal-quarter plan and think the Church should take the initiative in calendar reform.—Rt. Rev. E. C. Seaman, Bishop of North Texas.

The Ohio Chamber of Commerce is in favor of a world conference to discuss this matter.—G. B. Chandler, Secy., Ohio Chamber of Commerce, Columbus, O.

The subject is one of wide interest.—T. C. Woo, Secy.-Gen., Ministry of Education, Nanking, China.

The World Calendar of 12 months is a step in advance.—Morgan H. Grace, Exporter, New York.

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INTERNATIONAL ORGANIZATIONS FOR REFORM OF THE CALENDAR

ARGENTINA: Comite Argentino del Calendario Mundial, Dr. C. D. Perrine, Chairman, Cordoba Observatory, Cordoba.

BELGIUM: Belgian National Committee on Calendar Reform, Royal Observatory, Brussels.

BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

BRAZIL: Comite Brasilero del Calendario Mundial, Captain Radler de Aquino, Chairman, Rua Raul Pompeia No. 133, Rio de Janeiro.

CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comite Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

COLOMBIA: Comite Colombiano del Calendario Mundial, Dr. Eduardo Posada, Chairman, Consulado General de Honduras, Apartado 42, Bogota.

COSTA RICA: Comite Costarricense del Calendario Mundial (Iqualmente de Guatemala, Honduras, San Salvador y Nicaragua), Don Teodoro Picado, Chairman, Ministro de Educacion Publica, San Jose.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38 Parliament Street, London.

FRANCE: Bureau d'Etudes pour la Reforme du Calendrier, Paul Louis Hervier, Secy., 5 Rue Bernoulli, Paris.

GERMANY: German National Committee on Calendar Reform, Ministry of the Interior, Berlin—Der Weltbund fur Kalenderreform, Dr. Rudolph Blochmann, Secy., 24 Lorsenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform, Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRISH FREE STATE: Committee for Calendar Reform, E. K. Eason, Secy., 80 Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comite Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comite Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, Panama.

PERU: Comite Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia, Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatory, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., 4 Jenatschstrasse, Zurich. Comité International de Coopération de l'Association Universelle du Calendrier, M. Raymond Mage, Secrétaire Général, Rue Butini, 3, Geneva.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Iqualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, calle Sierra 2268, Montevideo.

EDITORIAL PARAGRAPHS

The revision plan approved by Mexico is that for which The World Calendar Association is working, the arrangement which involves only slight changes in the length of certain months in order to provide equal quarters and a perpetual calendar. The scientists endorsed this and disapproved all proposals for a thirteen-month calendar.—Providence *Journal.*

It is interesting to note that the 12-month scheme is in substance the same that was embodied in a Calendar Reform Bill brought before our Parliament in 1914 by the late Mr. Robert Pearce, M.P., principal champion in Parliament of the Daylight Saving Bill.—London (England) *Great Thoughts.*

For the next few years we shall hear quite a bit about calendar reform. . . . Calendar reform is nothing new. The old Julian Calendar was itself revised to correct an error of 11 days over a period of many centuries. — Auburn (New York) *Citizen Advertiser.*

More important to the general public in every country than the adoption of the metric system, of standard time, or any similar improvement in systems of measurement, is the proposed revision of the calendar.—Toronto *Churchman.*

It is believed that calendar reform will simplify many business and legal matters. Sound reasons for it are advanced by sensible people, but it is going to take time to win popular support.—Alpena (Mich.) *News.*

Astronomy has become an exact enough science to permit the construction of a calendar that would be both simple and accurate. While every consideration should be given to the beliefs of every religion, blind intolerance should not compel the world to struggle through the centuries with an antiquated, awkward jumble of years, months, weeks, days and hours with which to measure their passing.—Mobile (Alabama) *Register.*

The American Philosophical Society, with a membership of 500 men of letters, science and liberal arts, has expressed its approval of the 12-month reformed calendar. So has the Chamber of Commerce of New York State.—Faribault (Minn.) *News.*

There seems no good reason why we should not adopt The World Calendar.—Nanaimo (Canada) *Press.*

A twelve-month calendar, each quarter containing exactly three months, 13 weeks, 91 days has many advantages over the 13-month calendar advocated by other groups, in that it conforms to the solar year of 365.2422 days, and the natural seasons, besides introducing economy and efficiency, facilitating statistical comparisons, coordinating different time-periods and stabilizing religious and secular holidays.—Longview (Washington) *News.*

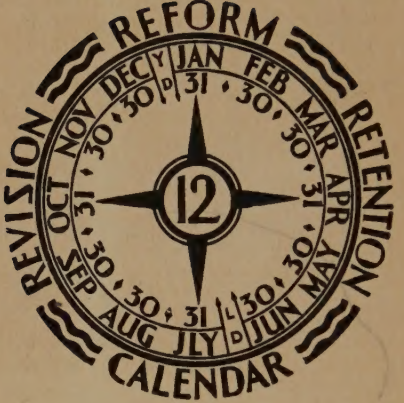
Business organizations, railways and transport companies, workers and holiday makers, seaside and country resorts with the general public want fixed dates for Easter and Whitsuntide holidays, which now drift with the moon t h r o u g h five weeks—between March 22nd and April 25th.—Wiltshire (England) *News.*

The year 1939 will begin on Sunday, according to our present calendar, and proponents of the new calendar hope that the change from old to new may be made at that time, as the transition would then be almost imperceptible. — Grand Forks (North Dakota) *Evening Herald.*

The initiative in calendar reform has now passed from the V a t i c a n to the League of Nations.—Kingsway (England) *Church Times.*

Adoption of a World Calendar which would place Easter each year on April 8th, a definite date, seems the most sensible thing.—Iowa City (Iowa) *Press Citizen.*

The problem of reforming the calendar is principally a matter of finding a satisfactory formula for a change without making the change so sweeping that it could not possibly secure general approval. . . . The present movement for calendar reform retains the 12 months under their present names. In fact, the alterations are so slight that they would be hardly noticed. Yet they accomplish all that accountants and business men desire.—Summerside (Canada) *Farmer.*



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